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ABSTRACT

Resulting from a Sacramento City College (SCC) project to improve teaching and learning by directly involving faculty in research to measure student learning outcomes, this document contains reports by seven SCC faculty members on their own classroom-based research projects. "Skills-Intervention Instruction," by Linda Briggs, describes a study which determined that skills-intervention instruction had a positive effect on students' reading, writing and critical thinking skills. "Integrating Content Area, Study, and Writing Skills Instruction," by Robert T. Carroll, reports on a project which sought to measure the effect of integrating study and writing skills instruction with content area instruction. "Intervention Strategies for Student Retention," by Barbara Davis, presents findings from a study which measured whether early student/teacher commitment would reduce the high numbers of initial class drops. "Teaching for Competency," by Liz Ginsburg, compares second semester college Spanish classes taught by a communication-oriented method with classes taught under more traditional methods. "Math Skills and the Hand Held Calculator," by Ron Hatton, examines the effect of hand held calculator use and non-use on students' learning. "Instructional Methods for Teaching Comprehension Skills," by Del Prescott, compares two models for teaching reading comprehension skills. Finally, "Prediction and Other Strategies Using Students' Experiential Background in Teaching Economics," by Linda L. Stroh, reports on an attempt to enhance student understanding of the economics term "Human Capital Investment" by evaluating students' own reasons for attending college. Attached exhibits include: (1) correspondence, agendas, and other working papers of the project; (2) a list of research applications; (3) a 31-item bibliography; and (4) a survey form for the seven faculty members whose research applications were accetped for the project. (JMC)

ED324064

SACRAMENTO CITY COLLEGE

LEARNING RESOURCES DIVISION

CLASSROOM BASED RESEARCH REPORT

FUNDED IN PART BY THE CALIFORNIA COMMUNITY COLLEGE FUND
FOR INSTRUCTIONAL IMPROVEMENT

FINAL REPORT
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JUNE 1987

Sacramento City College
Learning Resources Division

Classroom Based Research Project

FOREWORD

This report on Classroom Based Research represents the final results of a project, supported in part by the California Community Colleges' Chancellor's Office, Fund for Instructional Improvement, and conducted at Sacramento City College during 1985-87.

The intent of this project was to improve teaching and learning by directly involving teachers in research efforts to measure student learning outcomes. It was based on the premise that minor adjustments in teaching methodologies, when appropriately identified and implemented, can have a significant impact on learning. Through the course of this project, it was also discovered to have a significant impact on teaching.

The material presented in this report is the work of many people involved in the Classroom Based Research Project and should be reviewed accordingly. Within this report, seven different research studies are presented by seven different faculty members. To preserve the uniqueness of their work, each study is presented as prepared by each research faculty. It is worthwhile to note that the statistical calculations, prepared in collaboration with the research advisor, do not represent the complete thrust of this project, but does provide quantitative data on teaching and learning.

SACRAMENTO CITY COLLEGE

CLASSROOM BASED RESEARCH PROJECT

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SACRAMENTO CITY COLLEGE

CLASSROOM BASED RESEARCH PROJECT

EXHIBITS

A. LETTER OF INVITATION TO ADVISORY COMMITTEE WITH BRIEF PROJECT ABSTRACT

B. LIST OF ADVISORY COMMITTEE MEMBERS

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E. ANNOUNCEMENT AND APPLICATION

F. LIST OF APPLICATIONS/SELECTED PROJECTS

G. APPLICATION RECEIPT LETTER

H. LETTER OF ACCEPTANCE

I. LETTER OF REJECTION

J. REPORT UPDATE

K. BIBLIOGRAPHY

L. EVALUATION INSTRUMENT

M. DISSEMINATION RELEASE

CALIFORNIA COMMUNITY COLLEGE
CHANCELLOR'S OFFICE
FUND FOR INSTRUCTIONAL IMPROVEMENT

FINAL REPORT
FOR
SACRAMENTO CITY COLLEGE
CLASSROOM BASED RESEARCH PROJECT
1985 - 87

1. Provide a brief description of the project and the activities which were actually carried out to bring the project to completion. If the project had to be adjusted due to reduced funds or other factors, describe the project in its adjusted form and not as originally described in your application for funding. Also specify when the project actually began and when it was actually completed.

The purpose of this project was to improve teaching and learning through classroom based research. It was based on the premise that minor adjustments in teaching methodologies, when appropriately identified and implemented, could have a significant impact on learning. The major problems addressed in this project included: a) the lack of adequate classroom based research at the community college level; b) the need to strengthen the quality and vitality of education functions; c) the need to provide easily replicated models for improving instruction and learning; and d) the need to secure essential resources to provide for the development and renewal of community college staff. The desired outcomes for this project consisted of a) a core of faculty trained in conducting classroom based research; b) a resource bank of materials on classroom based research; c) a renewed faculty motivated to conduct further classroom based research; and d) replication of project models on a statewide basis.

To implement this project, a series of activities were conducted to meet specific objectives and to complete the project.

* An institutional project team/adhoc advisory committee was established to assist and advise the project director in implementing the project (Exhibit A, Letter of Invitation and Abstract). The adhoc advisory committee was comprised of individuals representing various disciplines and levels of staff, i.e. management and faculty (Exhibit B, List of Advisory Committee Members). The role of the committee was to provide recommendations for ensuring the success of the project and to generate ideas for classroom based research studies.

* A planning meeting was convened, resources were identified and procedures outlined for project operations (Exhibit C, Agendas; Exhibit D, Minutes of Meetings). Advisory committee members provided ideas on how best to implement this project to ensure campus wide participation and institutional acceptance and support. Recommendations were made for promoting participation and selecting faculty to conduct classroom based research studies (Exhibit E, Announcement and Application). A subcommittee was formed to review faculty applications for conducting classroom based research studies, and criteria was established to select seven faculty members to conduct the studies. For the selection process, consideration was given to: a) appropriateness of the research proposal, b) feasibility/ practicality of conducting the proposed study, c) diversity of proposed study compared with all applications, d) equitable representation of campus disciplines or topic issues, and e) thoroughness of the completed proposal.

* An inhouse research advisor was selected to assist with the application review process, to conduct small group seminars, and to provide individual consultation to research faculty. Seven faculty members were selected from eighteen to conduct the classroom based research studies (Exhibit F, List of Applications and selected projects; and Exhibits G, H, and I, Letters of Notification). These faculty members met as a group with the internal research advisor, project director, and project administrator to review the conditions of the grant, to be advised about the operational procedures and support mechanisms, and to refine the focus of their individual studies.

* Seven classroom based research studies were conducted during Spring 1987 (Exhibit J, Report Update). The primary activities to complete this objective consisted of one-to-one consultation sessions with the internal research advisor and project director, and research faculty completing their tasks in the classroom. Individual meetings were held approximately every three weeks to ensure the progress of the project, to process and prepare necessary data, to address problems, and to discuss methods to handle data, analyze results, and write final reports for individual studies.

* Resource materials were gathered as part of the project. This was an ongoing process which consisted of reviewing information on the topic of classroom based research, as well as compiling information and data related to the seven classroom based studies conducted at Sacramento City College. Resource data compiled includes pertinent articles and a brief bibliography (Exhibit K) on classroom based research. Other materials consist of data collected for the seven studies, and information on each individual study which includes a description of the study, an explanation of the activities carried out within the studies, presentation of results and analysis of the study, limitations and/or problems with the study, and recommendations for replication and/or further investigation.

* In the Spring of 1987, an informal presentation on this Classroom based Research Project was made at a Northern California Staff Development Conference. Representatives from approximately twenty-five community colleges were in attendance, and the response to the concept of classroom based research was very positive. Many of the people expressed a keen interest in learning more about the project, activities, and results for possible use at their institutions.

* Due to the positive response and high level of interest in this project, staff in the Learning Resources Division prepared two grant proposals to secure funds for further development of classroom based research. A preliminary proposal was submitted to the Fund for Instructional Improvement in Post Secondary Education (FIPSE) and a full proposal for a Phase II project was submitted to the California Community Colleges' Chancellor's Office, Fund for Instructional Improvement. Both proposals were intended to extend the classroom based research studies to other community colleges beyond Sacramento City College by involving other college faculty in replicating previously conducted studies at Sacramento City College and also conducting new studies. It was also planned to prepare a practical handbook for use in implementing classroom based research studies. Although neither application was approved for funding, continuing efforts will be made to secure resources to continue advancing classroom based research.

* An evaluation form (Exhibit L, Evaluation Instrument) was sent each of the participating faculty on the project. A summary of the responses and other evaluative comments are reported in the evaluation section (Question #3) of this final report.

* Project results were compiled for dissemination to promote replication. All information is packaged for distribution to California community colleges and other appropriate educational agencies and institutions. An abstract has also been prepared for distribution to educational publications (Exhibit M).

* Adjustments to the original project included: 1) A time extension for one year on the project completion date. This was necessary because of difficulties in schedule coordination and the need for institutional collaboration. 2) The use of an internal research advisor in lieu of an external research consultant. This adjustment was recommended to provide research faculty with essential on-going assistance rather than limit them to a few sessions with an external consultant. 3) The deletion of videotape recording of specific activities because the external consultant was not used and other events were not appropriate for videotaping. 4) It was not necessary to utilize district data processing due to the nature and scope of the project and because Sacramento City College was able to provide the necessary data and compute the statistical tests for the individual studies. The project was initiated in July 1985 and completed in June 1987.

2. List all materials which are now available or will be available to those desiring them. (Although materials developed with funds from the California Community College Fund for Instructional Improvement may not be distributed for profit to California institutions, it is appropriate for such materials to be made available <u>at cost</u> of production.)*

This final report as submitted in its present form is available upon request. Other materials that will be provided upon request include:

1) A copy of an application (1987-88) to the Fund for Instructional Improvement of Post Secondary Education (FIPSE) to conduct a Phase II project on Classroom Based Research.

2) A copy of an application (1987-88) to the California Community College Chancellor's Office, Fund for Instructional Improvement to conduct a Phase II project on Classroom Based Research.

3) A copy of an application to the Sacramento City College Staff Development Committee, to conduct three Classroom Based Research studies during 1987-88.

4) Data used for completing the studies.

* No charge should be made for content of material, only for the actual cost of paper or other material, copying expense, mailing, etc.

3. Provide a detailed evaluation of the project. This evaluation may require several pages and should include specific references to those project activities which you think were effective and those which were not effective. Include in your assessment of the project specific recommendations to those who may wish to replicate the project on their own campuses. Evaluations may have been carried out by project staff and/or an outside evaluation team. Indicate who performed the evaluation and the procedures which were followed. Attach the evaluation to this form.

The methods of evaluation used for this project were both process and product. Process evaluation was concerned with successful implementation of the project and evaluation of the project by the participants. Product evaluation was concerned with the results of the project as evident from the collection, development, and production of material resources. This includes support materials and documented project results.

The following narrative provides an analysis and evaluation of project activities and results.

* To begin the project, the first task was to establish an advisory committee and project team. This was successfully completed and consisted of diverse representation campus wide. This was a critical starting point since gaining institutional support and participation was important to ensure the success of the project. A listing of the advisory committee members and areas they represent have been included in this report, in addition to agendas and minutes of the meetings conducted.

  It should be noted that convening a large group of college staff with different schedules does present problems, and this is especially true during the summer or at the beginning of a new school year. Fortunately, the people at Sacramento City College were willing to commit time in the late afternoons to assist with the project.

* The next task was to adopt procedures for project operations. This phase was concerned with logistics, protocols, operations, and setting a direction for the project. In consultation with the advisory committee, recommendations were provided as to what type of classroom based research activity would have the potential to be of the most benefit to the institution, faculty, and students. Since classroom based research is a new concept at the community college, this aspect of the project generated considerable discussion and a diversity of ideas. The final result of these discussions was an agreement on the promotion of the project to encourage participation and suggested guidelines for selecting faculty participants to conduct classroom based research studies.

Logistics for the project were managed through the internal Staff Development Office, which enhanced the project operations since it was not necessary to create another college entity to oversee the project activities. This is an extremely important element for a project of this magnitude, since reporting, coordination, and information dissemination could follow a regularly recognized process.

Since the staff development function of the college is managed as part of an administrator's assignment with no clerical support, the grant provision for funding clerical support was a very important aspect in ensuring the success of the project. In addition to routine correspondence and record keeping, the clerical support was instrumental for the on-going processing of information which was necessary to assist the research faculty to keep the research activity progressing. Also, this support allowed for the professional preparation of the final report.

* Announcing opportunities for faculty to apply to conduct classroom based research studies was the next phase in this project. This was achieved with minimal difficulty and, once the promotion efforts were initiated, it generated interest and discussion from many segments of the campus. A simple single page announcement and application form was used to solicit participation from the faculty. In consultation with advisory committee members, it was determined that making the application process simple would encourage faculty with all levels of expertise to respond. It was acknowledged that the concept of research had the potential for screening out very good ideas as some faculty might think they were not adequately prepared to conduct classroom research. Careful thought and talented graphic design was used to create the necessary, yet simple, form. A total of eighteen applications were submitted. For Sacramento City College, this was considered a very good response ratio.

* Selecting seven research studies from the eighteen applications required the advisory subcommittee to review and rank the applications and then to meet and discuss selection of the studies. Although it was a challenge to choose only seven (all applications warranted merit), this task was completed with minimal difficulty. Previously established criteria facilitated the selection process. This criteria included 1) appropriateness of the proposed study, 2) feasibility/practicality of conducting the proposed study, 3) diversity of the proposed study compared with all applications, 4) equitable representation of campus disciplines or topic issues, and 5) thoroughness of the completed proposal. The assistance of the Sacramento City College internal research advisor was critical in this process. Personal letters were sent to each person who applied to conduct a study informing them of the outcome of the selection. It is important to note applications were received from almost every segment of the college, full and part time, long-tenured and new faculty.

* The original proposal planned for an external consultant to assist with the project. However, in consultation with advisory committee members, a decision was made to utilize the expertise of an internal research advisor. It was recommended that it would be more beneficial and effective to have an internal advisor available on a regular basis to offer on-going assistance in lieu of an external consultant whose time and accessibility would be limited.

  Comments from the research faculty indicated the decision to work with someone in-house was a wise one, since assistance was immediately available on an as-needed basis. Research faculty appreciated and enjoyed the opportunity for impromptu meetings which allowed them the opportunity to address issues of concern and then to proceed with the next phase of their study.

  Small group seminars and individual consultation sessions among research faculty, the project director, and the research advisor also proved to be a very worthwhile activity for the project. These sessions permitted for sharing of ideas, updates on progress, raising problems, finding solutions, advancing the work tasks, and provided a productive and stimulating environment for accomplishing individual tasks. The cross fertilization of ideas among various disciplines to improve teaching and learning was a delightful learning experience. It is also worthwhile to note, that of the seven participants, some of the faculty had never met one another before. The key to success in this endeavor was regularly scheduled sessions with clearly established tasks to complete.

* Providing for the clerical needs of the research faculty was determined to be a significant factor in this project. Research faculty needed to have data compiled and presented in a manner that the advisor and faculty could work with in the analysis of the data. This support was identified as essential for the successful completion of the project. Quick processing maintained the momentum and high level of interest on the part of the faculty.

* The seven classroom based research studies were conducted by each of the individual research faculty, and the results of their efforts are reflected in the individual papers included in this report. Problems and limitations identified in the faculty papers provide evaluative information on the study. In addition, the individual research reports serve as the final product of the classroom studies for an overall evaluation of the faculty work.

* The last item to be considered in evaluation of this project concerns the depth and quality of resource materials developed as a result of this project. The final report, faculty research papers, and support documentation should serve as evidence of the value of the materials which resulted from the project. In addition, the bibliography provides useful information for anyone interested in learning more about classroom based research or interested in replication of a research study.

* Overall, institutions concerned with implementing or replicating a project such as this should give careful attention to administrative leadership (we were successful in our endeavors due to the Staff Development Officer); careful scheduling due to the nature of research usually requiring a full term; adequate clerical assistance for research faculty; availability of an internal advisor/expert; and project coordination. Finally, institutional recognition and support is essential in order to gain faculty interest and continued participation.

* The Classroom Based Research Project conducted at Sacramento City College was a success. Although there may have been a few logistical problems, the final results certainly made the efforts most worthwhile. To improve teaching and learning, revitalize faculty, and to supplement staff development programs, Classroom Based Research is a demonstrated activity which has the potential to achieve these goals.

* A review of literature pertaining to classroom based research was conducted for this project. A notable author and educator, Dr. K. Patricia Cross from the Harvard Graduate School of Education, has written some very relevant articles on the concept of Classroom Based Research. Her work clearly outlines the value, relevance, and timeliness of teachers doing research in their classrooms and further supports the importance of involving faculty in classroom research studies. She also points out that very little has been done at the community college level and there are some information gaps relative to this practice.

  One of the more succinct and stimulating discussions about classroom research was a presentation by Dr. Cross titled "Improving Learning in Community Colleges" at the League for Innovation Conference on October 8, 1986 in Miami, Florida.

  In her presentation, Dr. Cross addresses the need for classroom research. She suggests that not just what is taught is important, but how it is taught is critical; that there will continue to be discussion as to what constitutes good or effective teaching, which has been based primarily on instructor ratings and not student outcomes; and that there is need to identify better measures and criteria for measuring quality education. In reviewing the need for improved methods or standards for evaluating the quality of instruction, Dr. Cross identifies three major factors which she indicates are <u>missing</u> from available literature.

  First, information on what teachers are trying to accomplish, what they want students to learn from them, and what are they doing in the classroom. She suggest more attention should be given to what teachers are trying to do. Second, that there is a gap between research and practice because there is a need for a "constructive approach" to apply research to improve practice.

Dr. Cross suggests "that the exchange of knowledge from many specific classrooms will give teachers more useful insight into the teaching/learning process than the search for generalizations across a representative sample of students, teachers, and subject matters." Also, that knowledge gained from doing research is more likely to be used than what is gained from reading about research. The third item that is missing from the literature is on "how to conduct research in and on the classroom." Dr. Cross suggests that the most useful research will be done by teachers in their own classrooms. This approach will help the teacher to evaluate their effectiveness, foster intellectual stimulation, and will provide professional renewal for teachers.

* Through the initial Fund for Instructional Improvement grant awarded to Sacramento City College, we have learned much about the concept of classroom research and understand there is a tremendous amount of work still to be accomplished. The most important knowledge gained is that faculty are very interested in this concept and that they are willing to engage in classroom research with appropriate resources and assistance. As a result of this project, Sacramento City College will continue the support of classroom based research through a mini Staff Development grant. Although modestly supported, efforts are being made to continue classroom based research. Additional efforts will also be made to secure external funds to further develop classroom based research studies.

4. Provide a detailed itemization of budget expenditures during the period for which the project was funded. (If necessary, use an additional page to explain how funds were spent within each of the four budget categories: (1) Professional Salaries, (2) Clerical Salaries, (3) Books, Supplies, and Equipment, and (4) Other Direct Operating Expenses.

FII GRANT.....	$ 14,852.00
1. Professional Salaries	
Project Director	3,005.40
Research Advisory	1,507.38
Research Faculty	7,032.56
2. Clerical Salaries	
Clerk I	2,004.50
Benefits	294.00
3. Books, Supplies, and Equipment	992.38
4. Other Direct Operating	-0-
TOTAL	$ 14,836.22
BALANCE	$ + 15.78

SACRAMENTO CITY COLLEGE

CLASSROOM BASED RESEARCH PROJECT

RESEARCH REPORTS

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Skills-Intervention Instruction

A Research Project Conducted By
Linda Briggs
Languages and Literature Division
Sacramento City College
Spring Semester 1987

DESCRIPTION

This project is concerned with whether skills-intervention instruction has a positive effect on students' ability to: (1) read a textbook for understanding; (2) organize and write an essay answer; (3) answer text-related critical thinking questions of an inferential and/or evaluative nature; (4) view themselves as active, effective readers; and (5) improve their overall reading scores on a standardized reading test. Skills intervention instruction is defined as classroom instruction and practice in reading, writing, and study skills taught in addition to and in conjunction with a student's regular content, transfer level class.

PROBLEM

The GO project at Sacramento City College was created to help under-prepared students achieve success in a transfer level content course as well as to improve those students' reading, writing, and study skills. The project was designed to meet the needs of students whose reading and writing skills were below what would be expected of and needed by students enrolled in a transfer level course.

In the Fall of 1986, students identified by the College's assessment test as below college level in reading and writing were encouraged to enroll in the GO Project, concurrent enrollment in a Sociology class, an English 71 (or developmental reading) class, and a Human Development 1 (study skills) class. Students who elected to do this signed up for designated sections of English, Human Development, and Sociology. The intent of this structure was to facilitate student success in the Sociology class and to improve skill levels through practice using the sociology materials in the English and Human Development classes. The instructors in these classes met regularly to plan and discuss progress and problems.

Throughout the semester, students in the GO project engaged in reading, writing, and study skills practice which focused on the assignments and material in the sociology class. The skills instruction in the English class consisted of essay writing for the sociology class, vocabulary development using sociological terms, and study reading of the sociology text (SQ3R, effective questioning, cognitive mapping, outlining, summarizing, information charting, and other techniques).

One reading lab hour per week was also required. This type of integrated instruction has been recommended by reading experts for years because of the desirability of immediately associating and using skills learned in an English or study skills class with what is being required in a content class. The "hands on" nature of the skills instruction should act as added incentive for skills improvement. After participating in Project GO as the English instructor during the Fall semester, I observed improvement in the students' skills level, yet I also felt disheartened by the distance the students still had to go and the amount of energy that the course took. The perennial question, "Was it worth it?" unrelentingly lurked in my mind.

The purpose of this research project was to gather some data from the Spring semester GO project to answer the question "Was it worth it?" or "Is skills intervention instruction an effective method for enhancing students' reading, writing, and study skills?"

PROCEDURE

Four pre and post test measures were used: 1) The Nelson-Denny Standardized Reading Test, forms E and F; 2) A five question informal reading inventory using a page of the sociology text as the source of the questions; 3) A student essay written in response to a critical thinking question using the same sociology text as the informal reading inventory; 4) A reading habit inventory.

These measures were administered to two sections of Sociology 1A. One half of the students in one section of the sociology classes were participants in the GO project. Therefore, the regular sociology students who were not enrolled in GO acted as the comparison group. At the end of the semester, the pre and post performance levels of the GO students were analyzed and compared with the comparison group's.

At the beginning of the semester, all students in both sociology sections were given the above four measures within the first two weeks, in the sociology classroom. Two class periods were needed for administration. The Nelson-Denny test was intended for measuring general reading comprehension and vocabulary levels (both raw scores and reading grade level were available); the informal reading inventory was meant for assessing the ability of the students to understand their text; the essay response was for judging the ability of students to write a well-structured and relevant essay and to answer a critical/inferential thinking question; and the habit inventory was to determine the students' perceptions of themselves as readers and learners. The GO students subsequently received instruction in reading, writing, and study skills while the control group participated in no special skills exercises.

Scoring of the objective standardized test and informal reading inventory presented no problem. The habit inventory was done on a Likert Scale of 1-5. The essay was graded by the English instructor and another instructor. Names were covered and scores from 0-7 given based on the following criteria:

1) Introduction - 1 point
2) Conclusion - 1 point
3) A body of at least 2 paragraphs - 1 point
4) Definition of terms - 1 point
5) Examples and/or explanations - 1 point
6) Accuracy of content - 2 points

If the two instructors disagreed by one point, it was agreed that the English instructor's score would stand. If they disagreed by more than one point, the essay was re-scored by the English instructor. The same procedure for testing and scoring was done at the end of the semester. Again, two class periods were needed for test administration.

DATA AND ANALYSIS

The analysis part of this report will consist of three parts:

Part 1: Hypothesis tests that will attempt to establish that the students in Project GO show a significantly higher increase in test scores than students in the Control classes.

Part 2: Hypothesis tests that will attempt to establish that the students in Project GO show a significant increase in test scores using the pre-test and post-test scores obtained.

Part 3: Confidence interval estimates for the mean differences in pre and post test scores for the students in Project GO.

For each part, the following symbols will be used:

$\bar{x}$ = the mean difference (posttest/pretest) for students in Project GO.
s_1 = the standard deviation for the distribution of differences in test scores for the Project GO data.
$\bar{y}$ = the mean difference (posttest/pretest) for students in Control classes.
s_2 = the standard deviation for the distribution of differences in test score for the Control classes.

The following data will be used:

IRI (Informal Reading Inventory)	$\bar{x} = 1.143$	$s_1 = 1.292$	$n_1 = 14$
	$\bar{y} = 0.310$	$s_2 = 1.039$	$n_2 = 29$
Essay	$\bar{x} = 2.643$	$s_1 = 1.906$	$n_1 = 14$
	$\bar{y} = -0.069$	$s_2 = 1.280$	$n_2 = 29$
Nelson-Denny E & F Total Raw Score	$\bar{x} = 11.800$	$s_1 = 8.719$	$n_1 = 15$
	$\bar{y} = 7.862$	$s_2 = 10.155$	$n_2 = 29$
Habit Survey	$\bar{x} = 7.250$	$s_1 = 11.307$	$n_1 = 12$
	$\bar{y} = 3.000$	$s_2 = 10.114$	$n_2 = 28$

Part 1

For each hypothesis test:

μ_1 stands for the mean difference in pre versus posttest scores for the population of Project Go students.

μ_2 stands for the mean difference in pre versus posttest scores for the population of Control class students.

For each hypothesis test, the H_0 and H_a will be:

$H_0: \mu_1 - \mu_2 = 0$ (There is no difference in the changes in test scores.)

$H_a: \mu_1 - \mu_2 > 0$ (The change in test scores for Project GO students is greater.)

For each test, the test statistic will be:

$$T = \frac{\bar{x} - \bar{y}}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

For the IRI (Informal Reading Inventory data:

$$T = \frac{1.143 - (-0.310)}{\sqrt{\frac{1.292^2}{14} + \frac{1.039^2}{29}}}$$

$= 9.287$

For the Essay data:

$$T = \frac{2.643 - (-0.069)}{\sqrt{\frac{1.906^2}{14} + \frac{1.280^2}{29}}}$$

$= 4.515$

Using a t-distribution with 14 + 29 - 2 = 41 degrees of freedom, a critical t-value of 1.684 is obtained.

Since 9.287 > 1.684, reject H_0. There is sufficient evidence to force the conclusion that Project GO students show a significantly greater increase increase IRI test scores.

Since 4.515 >1.684, reject H_0. There is sufficient evidence to force the conclusion that Project GO students show a significantly greater increase in Essay test scores.

For the Nelson-Denny raw score data:

$$T = \frac{11.800 - 7.862}{\sqrt{\frac{8.719^2}{15} + \frac{10.155^2}{29}}}$$

$$= 1.341$$

Since 1.314 < 1.684, do not reject H_o. That is, there is not sufficient evidence to force the conclusion that Project GO students show a significantly greater increase in Nelson-Denny total raw scores.

For the Habit Survey data:

$$T = \frac{7.250 - 3.000}{\sqrt{\frac{11.307^2}{12} + \frac{10.114^2}{28}}}$$

$$= 1.124$$

Since 1.124 < 1.684, do not reject H_o. That is, there is not sufficient evidence to force the conclusion that Project GO students show a significantly greater increase in Habit Survey scores.

Part 2

For each hypothesis test:

μ_d stands for the mean difference in pre versus posttest scores for the population of Project GO students.

For each hypothesis test, the H_o and H_a will be:

$H_o: \mu_d = 0$ (There is no increase in test scores.)

$H_a: \mu_d > 0$ (There is a significant increase in test scores.)

For each test, the test statistic will be:

$$T = \frac{\bar{X}}{\frac{s}{\sqrt{n}}}$$

For each test, the critical t will be $t_c = 1.771$, based on a t-distribution with degrees of freedom 13.

For the IRI data:

$$T = \frac{1.143}{\frac{1.292}{\sqrt{14}}} = 3.310$$

For the Essay data:

$$T = \frac{2.743}{\frac{1.906}{\sqrt{14}}} = 5.188$$

For the Nelson-Denny raw score data:

$$T = \frac{11.800}{\frac{8.719}{\sqrt{15}}} = 5.242$$

For the Habit Survey data:

$$T = \frac{7.250}{\frac{11.307}{\sqrt{12}}} = 2.221$$

Each of the derived values of T are greater than the critical t-value 1.771. Thus, for each test, reject H_0. That is, there is sufficient evidence to force the conclusion that Project 60 students show significant increases in each of the four tests used.

Part 3

For each confidence interval, the following equation will be used:

$$\text{Upper limit} = \bar{x} + 2.160\left(\frac{s}{\sqrt{n}}\right)$$

$$\text{Lower limit} = \bar{x} - 2.160\left(\frac{s}{\sqrt{n}}\right)$$

The 2.160 factor is from the t-distribution with degrees of freedom 13 that is used to construct confidence interval estimates with a 95% confidence coefficient.

IRI Test:

$$\text{Upper limit} = 1.143 + 2.160\left(\frac{1.292}{\sqrt{14}}\right) = 1.889$$

$$\text{Lower limit} = 1.143 - 2.160\left(\frac{1.292}{\sqrt{14}}\right) = 0.397$$

Thus a 95% confidence interval estimate for the mean increase in IRI test scores is between 0.397 and 1.889.

Essay Test:

$$\text{Upper limit} = 2.643 + 2.160\left(\frac{1.906}{\sqrt{14}}\right) = 3.743$$

$$\text{Lower limit} = 2.643 - 2.160\left(\frac{1.906}{\sqrt{14}}\right) = 1.543$$

Thus a 95% confidence interval estimate for the mean increase in Essay test scores is between 1.543 and 3.743.

Total/G.E.:

$$\text{Upper limit} = 11.800 + 2.160 \left(\frac{8.719}{\sqrt{15}} \right) = 16.663$$

$$\text{Lower limit} = 11.800 - 2.160 \left(\frac{8.719}{\sqrt{15}} \right) = 6.937$$

Thus a 95% confidence interval estimate for the mean increase in Total/G.E. test scores is between 6.937 and 16.663.

Habit Survey:

$$\text{Upper limit} = 7.250 + 2.160 \left(\frac{11.307}{\sqrt{12}} \right) = 14.300$$

$$\text{Lower limit} = 7.250 - 2.160 \left(\frac{11.307}{\sqrt{12}} \right) = 0.200$$

Thus a 95% confidence interval estimate for the mean increase in Habit Survey test scores is between 0.200 and 14.300.

SUMMARY OF RESULTS

1) Project GO students showed a significantly greater increase in scores on the informal reading inventory than the comparison group.

2) Project GO students did not show a significantly greater increase in scores on the standardized reading test than the comparison group.

3) Project GO students did not show a significantly greater increase in scores on the habit survey than the comparison group.

4) Project GO students showed a significantly greater increase in scores on the essay writing than the comparison group.

CONCLUSIONS

Project GO students demonstrated a statistically significant increase in test scores on all four measures, indicating that the skills-intervention instruction most probably had a positive effect on their ability to read a textbook, write an essay answer, improve their overall reading comprehension, and enhance their reading self-perception. The confidence interval estimates for the mean differences in pretest and posttest scores indicate, given similar circumstances, that skills-intervention instruction will probably have a positive effect on increasing each of the four posttest measures. The positive numbers at both the upper and lower limits of each confidence interval estimate strongly indicate that any GO class will experience a positive difference in a pre and posttest scheme.

The data further demonstrate that GO students showed a significantly higher increase in test scores than students in the control classes in two areas, the Informal Reading Inventory and the essay response to a critical/inferential thinking question. This seems to indicate that the type of instruction GO students received in their reading and study skills classes helped them improve their textbook reading and essay writing skills more than they would have if they had not been in the GO project.

While the GO students increased their mean posttest scores on the standardized test and the habit survey more than the control group, the increase was not enough to demonstrate statistical significance. This may show that regular content course work or other parts of the college curriculum can also contribute to improvement in reading comprehension and reading self-perception.

In sum, the data indicate that the GO project has a positive effect on students' ability to: 1) read a textbook for understanding; 2) organize and write an essay answer; 3) answer text-related critical thinking questions of an inferential nature; 4) view themselves as active, effective readers; and 5) improve their overall reading scores on a standardized test. The GO project's area of greatest success was in helping students deal effectively with understanding their textbooks and write essay answers. These conclusions are a strong recommendation for the continuation of project GO and other skills-intervention programs that teach skills in conjunction with a content, transfer level course. It is a successful method of delivering skills instruction and promotes more skill improvement than student participation in a regular college course.

LIMITATIONS

There are several limitations to this study:

1) Students in the comparison group had higher skills than students in the experimental group at the beginning of the semester; therefore, their mean pre and posttest difference may not have been as large as the experimental groups because they did not have as far to go; i.e. some control students scored at the top of the grading scale for the standardized test at the beginning of the semester.

2) The essay and informal reading inventory were administered by the English 71 instructor. GO students had developed a personal relationship with the instructor by the end of the semester which may have been added incentive for them to strive harder than the comparison group.

3) The same informal reading inventory was used for both pre and posttests. This may have contributed to higher posttest scores; however, it should not effect the comparison of mean differences of the control and experimental groups.

4) The experimental group sample was small due to attrition or absences at test times.

5) The attitude of the comparison group toward the testing was at times negative. Some students expressed dissatisfaction at having to take tests that did not "count" toward their sociology grade. This could have adversely affected their test scores.

Integrating Content Area, Study, and Writing Skills Instruction

A Research Project Conducted by
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Philosophy Department
Sacramento City College
Spring Semester 1987

I. DESCRIPTION

The aim of the research project was to determine if there is a measurable effect of any significance when integrating study and writing skills instruction with content area instruction. Two content areas were studied for one semester: introduction to logic and introduction to philosophy. One section of each course was assigned activities aimed at improving specific study skills. The assignments covered the following areas: previewing textbooks and textbook chapters; taking notes in class and while reading a text; listening; using study cards; anticipating exam questions; preparing for exams; taking tests; reviewing and memory skills. The control groups did not receive any instruction in study skills as part of the content course. The Introduction to Philosophy experimental group was also assigned materials in a text designed to strengthen essay writing skills. The same content area materials were covered in each course. The study and writing skills assignments were not collected or graded.

I have spent several years developing handouts to assist my students in developing their study and writing skills. During the spring semester of 1986, I was granted a sabbatical leave to organize my handouts and write additional material for a workbook on study and writing skills. The workbook--called THE STUDENT SUCCESS GUIDE--is completed and was used by the experimental groups in the study. If such material can have an immediate effect, it would most likely show up in the final exam scores and the last essay assignments. Thus, final exam scores were compared for both pairs for classes studied. And, the last essay scores for the Introduction to Philosophy classes were compared. In addition, attendance rates, retention rates, course grades and units attempted/completed were also compared. In addition to comparing the experimental and control groups, those scoring below college level on the Nelsen Denny Form A reading test were grouped together and compared in the experimental and control groups. A survey was taken in the experimental groups aimed at determining how the materials were used by the students and how useful they found the materials.

II. METHODOLOGY

1. Pre-testing

The Nelsen Denny Form A vocabulary and reading comprehension test was given to all classes in the study. Standard deviations were calculated for each group of reading scores using the formula:

$$s = \sqrt{\frac{\sum(x - \bar{x})^2}{n-1}}$$

And 't' values were calculated to determine whether the measured differences were significant for the small samples used. A 't' value of 2.0 is significant at the .05 level for samples in the size range used.[1] The 't' value was calculated using the formula:

$$t = \frac{(\bar{x}_1 - \bar{x}_2)}{\sqrt{\frac{(n_1 - 1)\, s_1^2 + (n_2 - 1)\, s_2^2}{(n_1 + n_2 - 2)}} \sqrt{1/n_1 + 1/n_2}}$$

The mean reading grade level for the Logic control group was 12.7; for the Logic experimental group, it was 12.8. For the Intro to Philosophy courses, the control group mean reading grade level was 13.6, while that of the experimental group was 12.9. A 't' value of 0.03 was calculated for the Logic groups and 1.4 for the Introduction to Philosophy groups. Thus, differences in the mean grade reading levels for the classes were established to be insignificant. This was taken as justification for believing that the groups being compared were not significantly different in ways relevant to the variables being studies.

2. Instruments Used

The final exams in both the Logic and the Introduction to Philosophy courses were true/false, multiple choice exams. They were graded using a Scantron grading machine. The essays in the Intro to Philosophy course were graded by me. They were stacked and mixed and graded without concern for section. A 22 question survey was given to the experimental groups to evaluate how they used the study and writing skills materials. In addition, a survey was made of the control groups to determine the number of units they attempted and expected to complete for the semester. Data was kept regarding attendance and enrollment in the classes studies.

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1. Fadil H. Zuwaylif, General Applied Statistics, (Reading, Massachusetts: Addison-Wesley Publishing Co., 1974.)

III. RESULTS

INTRODUCTION TO LOGIC
SUMMARY DATA ANALYSIS

	CONTROL	EXPERIMENTAL	
Sample size (begin)	25	38	
Drops	8	11	
ESL students	3	3	
Sample size			
Final exam	17	27	
Retention rate			
Overall	0.68	0.71	
ACL	0.69	0.57	
Attendance rate	78%	79%	
Reading level			
Mean	12.7	12.8	
Final exam mean			
Overall	83.18	76.37	
ACL	85.00	80.00	
Course grade mean	80%	75%	
Sample: Reading below college level	9	16	
Retention rate	0.67	0.88	
Drops	3	2	
Final mean	79.7	72.9	
A's	0	0	
B's	4	5	
C's	1	7	
D's	0	1	
F's	1	1	
Standard deviation			
Nelsen Denny	3.60	3.34	t=0.03
Final exam	9.81	8.92	t=0.26

INTRODUCTION TO PHILOSOPHY
SUMMARY DATA ANALYSIS

	CONTROL	EXPERIMENTAL	
Sample size (begin)	36	37	
Drops	5	4	
ESL students	3	4	
Sample size			
Final exam	31	33	
Sample size			
Essay	29	33	
Retention rate			
Overall	0.86	0.89	
ACL	0.86	0.89	
Attendance rate	86.8%	88.3%	
Reading level			
Mean	13.6	12.9	
Essay mean			
Overall	87.97	85.03	
ACL	89.00	88.00	
Final exam mean			
Overall	66.79	65.30	
ACL	71.00	68.00	
Course grade mean	75%	76%	
Sample: Reading			
below college level	11	13	
Retention rate	82%	91%	
Drops	2	1	
Essay mean	85.25	79.33	
No essay	1	0	
Midterm mean	64.2	63.1	
Final mean	62.1	62.5	
A's	0	0	
B's	4	5	
C's	4	5	
D's	0	0	
F's	2	1	
Standard deviation			
Nelsen Denny	2.68	2.86	t= 1.4
Essay	5.95	8.57	t=0.21
Final exam	10.46	10.07	t=0.05

3.1 Summary of results

No significant difference was discovered between the experimental and control groups, with the possible exception being the difference in retention rates among those reading below college level.

3.2 Logic Final Exam Scores

In the Logic sections, the control group did better on the final exam than the experimental group. This difference is attributed to chance, the 't' value being 0.26. The mean for the Logic control group on the final exam was 83 percent; the mean for the experimental group was 76 percent. For those who scored below college reading level on the Nelsen Denny (BCL), the average of the control group was 80 percent; the average of the experimental group was 73 percent. For those who scored at or above college level on the reading test (ACL), the control group average on the final exam was 85 percent; the experimental group average was 80 percent.

3.3 Intro to Philosophy Essay and Final Exam Scores

In the Intro to Philosophy sections, the control group did better on both the essay and the final. These differences were also attributed to chance. The control group averaged 88 percent on the essay, while the experimental group averaged 67 percent; the experimental group averaged 65 percent. In the BCL groups, the average of the control group on the essay was 85 percent; the average of the experimental group was 79 percent. The averages on the final were 62.1 for the control and 62.5 for the experimental group. In the ACL groups, the average of the control group on the essay was 89 percent; the average of the experimental group was 88 percent. On the final, the ACL average was 71 percent for the control group and 68 percent for the experimental group. (See Part III for the calculations for standard deviations and 't' values.)

3.4 Attendance Rates

The attendance rates for the Logic groups were nearly identical: 78 percent for the control and 79 percent for the experimental group. For the Introduction to Philosophy groups, the attendance rates were also nearly identical: 87 percent for the control group and 88 percent for the experimental group. (The nearly 10 percent difference in attendance rates for Logic and Intro to Philosophy is not likely due to chance. Perhaps I offer a better Intro course than Logic course. Perhaps the subject matter is more attractive in Intro than in Logic.

Perhaps the fact that half of the grade depended on the scores on two tests and half on two essays in the Intro class, while there were seven equally graded assignments in Logic, was a main factor in the attendance rates. The Logic course required only one essay. However, a frequent comment on student evaluations of the Intro course was that there were not enough tests or graded assignments.)

3.5 Units attempted/Completed Rate

The Introduction to Philosophy control group expected to complete 91 percent of the units attempted for the semester; the experimental group expected to complete 98 percent of the units attempted. In logic, the numbers were nearly reversed: the control group expected to complete about 98 percent of the units attempted, while the experimental group expected to complete 93 percent of the units attempted.

3.6 Retention Rates

In Logic, the overall retention rate for the control group was 68 percent; for the experimental group it was 71 percent. In the Intro classes, overall retention was 86 percent in the control group and 89 percent in the experimental group. The retention rates in Logic for the ACL groups were 69 percent for the control and 57 for the experimental group. In the Intro ACL groups the retention rate was 86 percent in both the control and experimental groups.

Among those who read below the college level, the retention rate in Logic was 21 percent higher in the experimental group (88 percent) than in the control group (67 percent). In the Intro BCL groups the retention rates were 82 percent in the control group and 92 percent in the experimental group.

In the Logic experimental group, the retention rate was 31 percent higher in the below college group (88 percent) than in the above college group (57 percent). In the control group, the ACL (69 percent) group had a retention rate 2 percent higher than the BCL (67 percent). In the Intro experimental group, the retention rate for the BCL group was 6 percent higher than the ACL group (92 percent versus 86 percent). In the Intro control group, however, the BCL group had a retention rate which is 4 percent lower than the ACL group (82 percent versus 86 percent.)

Retention rates fluctuate greatly at City College, and the fact that the Logic experimental group was taught MWF at 9:00 a.m., while the control group met TT at 1:00 p.m., combined with the fact that no other significant difference was discovered between the two Logic or the two Intro groups, makes me very cautious about claiming that the study skills instruction was a significant factor in the higher retention rate. This preliminary data, however, is suggestive and seems to warrant further investigation.

IV. SUGGESTIONS FOR FURTHER STUDY

While this study indicates strongly that integrating study skills into a content area course is very likely to have no significant effect on student performance, it also indicates that such instruction may have a positive effect on student persistence with a course. In any case, the fact that students were left on their own to do the assigned materials in study and writing skills makes it possible that some significant effect might be produced if graded assignments were made on the study and writing skills materials. The results of the Study Skills Survey (see Pages 28 and 29) indicate that the materials, while generally viewed favorably by the students, were not valued highly or used optimally. On a scale of 0 to 5, students in the experimental groups rated the study skills materials at 3.33 ((Intro) and 2.95 (Logic), indicating they did not find the materials highly useful. (The ratings were about the same when asked if they found the material useful for their other classes.) When asked if they thought the study skills materials would be more effective if graded assignments were made, the Intro group responded with an average 3.72 and the Logic group with an average 4.47 (where 0 = strongly disagree; and 5 = strongly agree).

V. COMMENTS

I believe I am justifiably discouraged by the results. It appears from the results of this study that the attempt to integrate study and writing skills instruction in content areas such as the Introduction to Philosophy and Logic has an insignificant, if any, positive effect on student performance. This may be due to the quality of the materials themselves, the way they were used or to the fact that study skills cannot be significantly enhanced in a single semester. The materials have been evaluated by several experts in study skills instruction and the reviews have all been favorable. Those who teach study skills courses would deny that such skills cannot be significantly enhanced in a single semester. Thus, I conclude that the materials were not used optimally.

SACRAMENTO CITY COLLEGE
CLASSROOM BASED RESEARCH PROJECT
SPRING 1987

STUDY SKILLS SURVEY

NAME _____

Using a scale of 0-5, with o the lowest and 5 the highest, answer the following questions. (Exception: the yes or no questions). Write your answers in the lefthand margin, next to the question number.

1. Do you use vocabulary cards? (5=frequently;3=sometimes;0=never)

2. Did you do the suggested vocabulary exercises? (5=most;3=some;0=none)

3. Did you do any of activity 8 on MOTIVATION? (most,some,none)

4. Do you keep a written weekly time management schedule? (5=always;0=never)

5. Did you do activity 10 on CONCENTRATION? (yes or no)

6. Did you do activity 11 on LISTENING? (yes or no)

7. Do you preview each chapter of your philosophy text before you read it? (always; sometimes;never)

8. Do you preview each chapter of your texts for other courses? (always;sometimes;never)

9. Do you write up a list of questions to answer for each chapter of your philosophy text? (always;sometimes;never)

10. Do you use study cards? (always;sometimes;never)

11. Do you mark up your text for study questions? (always;sometimes; never)

12. Do you use a notebook in class? (always;sometimes;never)

13. Do you use the divided page method of notetaking? (always; sometimes;never)

14. Do you use mapping to take visual notes? (always;sometimes; never)

15. Do you keep a notebook with your critical comments on course material? (always;sometimes;never)

16. Did you do any of the memory exercises? (5=most; 3=sometimes; 0=none)

17. Do you review the course material daily? (always;sometimes; never)

18. When you take a test, do you

    18.1 A. Preview the exam? (always;sometimes;never)
    18.2 B. Manage and Re-organize the exam? (always; sometimes;never)

19. Did you read the material on WRITING SKILLS? (yes or no)

    19.1 If yes, how useful did you find the material? (5=very useful; 3= somewhat useful; 0= of little or no use)

20. In your opinion, how useful has the study skills material been for you in this course? (5=very useful; 3=somewhat useful; 0=of little or no use)

21. In your opinion, how useful has the study and/or writing skills material been for you in your other classes? (5=very useful; 3=somewhat useful; 0=of little or no use)

22. Do you think the study and writing skills material would be more effective if graded assignments were made for the activities? (5=very much more effective; 3=about the same; 0=much less effective)

How many units did you enroll in this semester? _____

How many units do you expect to complete this semester? _____

COMMENTS:

I will conduct another research project which will use the materials differently. Graded assignments will be made on the study and writing skills materials. This will force all students to exercise their skills and will reward them for doing the exercises. If this does not significantly affect student performance, I would be led to conclude that integrating study and writing skills into a content area course is likely to have no significant effect on student performance, and to recommend that study skills courses be taught separately from content area courses.

Finally, I think a comment is necessary on the finding that the attendance and retention rates were significantly higher for the introduction to Philosophy classes than for the Logic classes. I plan to confer with other members of the Philosophy Department to see if this is typical or unique. If typical, the department may want to analyze and evaluate the situation and work towards improving the Logic retention rate. If unique, then I will want to further evaluate the data collected for this project--along with other relevant data--and see if I can't discover a way of improving the retention rate in my Logic sections.

Intervention Strategies For Student Retention

A Research Project Conducted By
Barbara Davis
Social Sciences Division
Sacramento City College
Spring Semester 1987

DESCRIPTION

During the Spring Semester 1986 at Sacramento City College, 7,858 students in the divisions of Social Science, Business, and Languages and Literature were identified as no-shows or dropped from classes between initial registration and the end of semester. The purpose of this classroom research project was to measure whether specific intervention strategies would help to retain students in the classroom. Five activities which could be applied in any classroom or discipline were selected for use. These activities were based on the premise that teachers can design, develop, and implement certain strategies for providing vital information about students and that these strategies would facilitate careful monitoring of individual student progress, especially during the first four weeks of the semester. The specific purpose of this project was to determine if this early student/teacher commitment is a factor in reducing the high number of initial drops.

PROCEDURE

Five intervention strategies were used throughout the semester: 1) communication by telephone and letters; 2) preparation of information cards; 3) name recognition and group process; 4) small group activities; and 5) goal setting activities. The intent of these strategies was to strengthen the interpersonal connections in the classroom--student to student and teacher to student, and to foster and support student success in a marriage and family (Sociology 3) course.

Because of the intent and nature of this project, the procedure did not follow the usual experimental designs. That is, there was not the use of both control and experimental groups. Furthermore, the information would not be quantified, and as a consequence, the usual statistical measures would not be used. The procedure was directed toward the study of the feelings, attitudes, and self-perceptions of the students in the experimental group. Therefore, the conclusions of this project present an analysis by the instructor of information obtained from the students.

During the first four weeks of the semester the instructor initiated communication with students who missed a single class session, first by telephone and, if necessary, by personal note or letter. The instructor was able to discern through the conversation if the student needed the help of additional support services on campus and referred students to these services. Students were personally introduced to the supportive staff by a note from the instructor or by the instructor personally. Students were not simply told "tutoring is available, counseling is available....." The instructor was careful in choosing supportive staff who could have a beneficial long-term relationship with the student.

Some of the supportive services that students needed included information about:

Child Care
Counseling--Academic and Personal
Time Management
Financial Aid and EOPS
Career Guidance--Direction and goal Setting
Tutoring
Transportation

Throughout the semester when students were absent, communication was attempted again through telephone calls and letters. A personal note/letter was sent to each student on the Thursday of Easter vacation with a reading enclosed and a note welcoming them back to class the next Monday.

Information cards (5 x 7") were completed the first day of class. On the front were the students' name, address, phone number, and attendance record. On the back of the card, students answered the following questions:

1. What are the characteristics of a healthy growing relationship?
2. Why are you in this class?
3. What do you want from this class?
4. What is your long-term goal?

With excitement and anticipation, the instructor immediately began to use the information to get a "feel" for the students. This information was also used throughout the semester to call or write students in order to refer them to other students who had similar goals, interests, and expectations, or even to introduce students to professionals in the community. One example of this was a student who wants to be a weatherman on television. The instructor introduced the student to a local practicing weatherman on Channel 10, who met with the student at the television studio and then took the student to lunch.

Name recognition activities were initiated the second class meeting. Students were paired and introduced to each other after spending five minutes answering the following questions:

What is your name?
What is your goal?
Why are you in school?
What do you do for fun?

After each introduction and in unison, each person's name was repeated by the entire class for each of the thirty-nine students. Students were encouraged to write down the name and the telephone number of at least two students sitting next to them. Small group activities which enhanced the facilitation of contact concepts were interspersed throughout the semester. Again, students had the opportunity to develop relationships with others in the class. Following are four examples of small group activities.

1. Students wrote their names on the front of a folded card, then on the inside of the card they wrote three words that described them as a person (no one sees those words except the student). Groups of five people were formed. The instructor wrote a series of questions on the blackboard beginning with information-giving questions and ending with more personally revealing questions. Each person in the group took a turn answering these questions. Each person had four sticky labels (one for every person in the group) on which they wrote the name and a term or phrase which described that person to them. The cards were sent around the group and each person had four sticky labels attached to the back of the card. They then saw if their perception of who they are (inside card terms) and how they are perceived by others were congruent.

2. The class was divided into half--chairs were arranged in two circles with chairs facing one another. The inner circle of students remained stationary and the outer circle of students shifted clockwise every one minute, after looking into the eyes of the person sitting across from them asking themselves "who is this person?" "What can you see through their eyes?" No one could talk while rotating in the circle. After completion of the nonverbal circle, each student had thirty seconds to tell the other what they saw. After completing this activity, each student wrote an essay--"What I Learned About Others, What I Learned About Myself."

3. Students in groups of five were given specific questions to answer in preparation for a chapter. For example, preceding the chapter on love, the questions were as follows:

   What is love? How do you give love?
   How do you know when you are loved?

   A recorder was selected who then reported back to the large group and interaction took place between the group.

4. Test preparation was a small group activity that consists of the following:

   -- Students met in small groups (no more than five)
   -- Instructor put good question criteria on board
   -- Each group was assigned a text sub-section
   -- Students used questions from their margin notes and come up with two good test questions
   -- Groups took turns asking questions of other groups (whole class discussion)
   -- Everyone was encouraged to comment on the validity of the questions asked.
   -- Instructor collected test questions from groups, used some in the test, and at the next session gave each student a copy of the compilation of questions to use as a study guide for the test.

SUMMARY/CONCLUSION

At the conclusion of the class, students were asked to respond to the question, "What is the most significant thing you learned this semester?" Some of the responses were as follows:

> The most significant thing that I learned in this class is that everyone has their own special uniqueness and that there is nothing wrong with the way I believe and that I am not alone.
>
> I learned about me. I do have something worthwhile to share with our group. I learned something about my fellow students. They are witty, intelligent, and also seeking to better themselves through education. We are indeed alike under the skin.
>
> ...but the "eye-ball" session stands out in my mind--this exercise forced me to physically face our classmates one on one and feel their energies. This focusing forced us to "see", I mean truly see this person.
>
> The most significant thing I have learned was how to be myself and also to be understanding.
>
> Not only did I love the information, but the perspectives of the people in class.
>
> This class made me realize how important it is to keep a good relationship with people. In other words, this class is the reason I get up on Monday, Wednesday, and Friday mornings!
>
> To remember that <u>everyone</u> has something to contribute, not to sell people short by judging what they have to offer before learning it.

I learned a lot about my classmates.

I learned that different cultures have different ways to do things.

The most helpful and interesting sessions to me were the sessions that were discussed together.

The most helpful and interesting ones were the small group discussions in which we found how the image we project to other people about ourselves is the same or different from our self image.

The activities gave us a chance to interact with other members of the class, and made me more comfortable when we were discussing topics.

The interaction with the class is great, my type of thing.

I feel very strongly that early intervention using specific strategies by instructors can make a difference in retention rates. One of the keys to retaining students is to devise ways of finding out who the students are, what is important to them, what they want from a class, what their learning style is, what their goals are and then use that information to network them with other students and support staff on and off campus. This is, in effect, creating a "safety net" which can sometimes catch a student and then give them the spring re-action to catapult them upward again. The importance of staff interaction to enhance student success became more evident to me. A Humanities instructor and myself, with shared information, mounted an effort to encourage a student through letters to return to school and complete the semester, and she did!

Close and careful monitoring of students, especially those at "high-risk" is crucial. Although the administration of the TASK test (reading) did not play a role in my original proposal, the timely use of information (scores) was very beneficial. I carefully monitored those with scores below the 10th grade level in the first four weeks, so that immediate intervention was possible, i.e., reading classing, writing classes, college success classes, tutoring, attempting to intercede immediately.

The information cards also were a tool of information not only with personal information, but also with skill information. I could recognize those students who had difficulty in writing. These strategies give the instructor the opportunity to recognize what students know and don't know. Establishing a trusting educational environment with less anxiety can also occur as a result of group interaction strategies. An educational environment where students are <u>directly</u> involved in learning and where ideas "fly" without judgments being passed and where critical thinking ability is created using this process.

The intervention strategies allowed me to follow-up and find out why two students dropped out. One took a fulltime job, and the other had a record of signing up for classes and dropping out after the financial aid check is given out.

Besides the strategies I said I would develop and use, I asked students to respond to the following questions:

--Some things I would change at Sacramento City College
--Reasons why I dropped a class
--Reasons why I was a no show

An overwhelming majority of the responses concerned themselves with interaction of staff/students. A sampling of student responses are as follows:

--He was a negative person; he would say that the students had no opinion.

--I didn't feel there was very much cooperation and understanding from the teacher.

--Felt there was no communication between the teacher and me. I felt discriminated.

--Teacher not enthusiastic - teacher talked too much about personal life.

--Teacher didn't make class interesting; he knew what he was talking about but he didn't know how to teach information to his students.

--I felt the teacher didn't like me - uncomfortable.

--I have dropped classes in the past because of rude teachers that didn't like me - they made school miserable.

Certainly subject matter and content is extremely important, but the ribbon tying the package together is the affective domain or interacting with each other in a caring, supportive, and honest manner.

Also demystifying how to succeed in college supports retention.

--Learn how to use the services of a college.
--Learn how to be comfortable and relaxed in a classroom.
--Learn how to speak to a group
--Learn how to listen

With a decreasing potential student pool, we must begin to look at how we can retain those students who are motivated to "jump through the many hoops" necessary to make it into our classes.

There is strong evidence that would warrant further study with multiple instructors and multiple disciplines. For me, the opportunity to research in the classroom some ideas I have carried for years was exciting! The design of this project is terrific--two of my colleagues who I respected and trust worked closely with me, asking the questions necessary to help me frame a way to find some answers. Throughout the semester they provided just the right amount of structure necessary to follow my own progress and to provide me with the skills necessary to complete it. Unfortunately, because the project is ending, I now have a higher degree of understanding about how to repeat this project with a broader base and will probably not be able to continue. In the future, I would hope a project such as this would be two semesters long and that the projects may be refined as the participants would be more knowledgable. Also, the interaction of participants from various disciplines was exhilarating!

Teaching For Competency

A Research Project Conducted by
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Spring Semester 1987

INTRODUCTION

The Teaching for Competency Program is a way of providing the implementation of a new direction in the foreign language profession. It takes time and resources to implement newly defined goals and it also requires basic changes in teaching foreign languages. The teaching focuses not on what has been taught but rather on what students can do with language, i.e. what communicative tasks can they accomplish. Teaching strategies, therefore, must be different--communicative student group work in the target language becomes essential--and teaching goals as well as student's performance also differ. Students must receive vast amounts of input in the target language from their teacher before students are able to deliver any meaningful output. Evaluation of students' performance in this teaching modality must be different from that of traditional methodologies. Evaluation/testing must be consistent with the principles of competency and should not be achievement oriented (Figure #1).

CALIFORNIA FOREIGN LANGUAGE COMPETENCY PROJECT

Teaching for Competence Program

CHARACTERISTICS OF
ACHIEVEMENT, CONTEXTUALIZED FORMATIVE, AND COMPETENCY
TESTS

ACHIEVEMENT*	CONTEXTUALIZED FORMATIVE	COMPETENCY*
• Scope of content limited to what was taught	•	• Scope open to what can be done with language
• Limited amount of material	•	• Unlimited material
• Measures discrete points	•	• Measures integrative use of language
• Student can study for test	•	• Student cannot study for test
• Student can score 100	•	• Student cannot score 100
• Compares students to each other	•	• Compares students to a standard
• Administered frequently	•	• Administered at major benchmark intervals
•	•	•
☐ Formative? ☐ Summative? ☐ How scored?	☐ Formative? ☐ Summative? ☐ How scored?	☐ Formative? ☐ Summative? ☐ How scored?

* Adapted from Penn Thompson

Rel (1/25/87)

(Figure 1)

It takes much practice before grammatical concepts can be used correctly at will. Moreover, because internalization requires considerable more practice than performing successfully on a few pattern drills, it cannot be concluded that internalization has occurred when students begin to use a specific language concept.

Research in second-language acquisition points out that students move through three phases while learning a second language: conceptual understanding, partial control, and finally full control.

The first phase involves understanding particular concepts. A textbook with clear and well-organized presentations of grammatical concepts is sufficient to meet the needs of most students. During this first phase the instructor may provide occasional clarification of the more complicated structure. (Those instructors who spend a major portion of class time presenting, clarifying, and drilling grammatical points unwittingly slow down students' progress by keeping them unnecessarily longer at this conceptual first phase, for the students are impeded from moving on to the partial control phase which is where most of class time should be spent.)

If students are to achieve partial control, they need to have ample time and opportunity to use and reuse particular concepts in meaningful, communicative situations. The focus needs to be on the message being communicated, not on the grammar rules underlying a given message. When students are able to use concepts without having to struggle with them, they have internalized them and achieved full control. But in order for this to happen, students need to practice the concepts extensively in a wide variety of situations.

The "spiraling" effect, is thus, so critical in competency because entry of new concepts is always combined with reentry, on a higher plane, of old concepts. Constant review is provided while students are learning to master different concepts whether at the conceptual, partial, or full control level.

Recent studies have focused on categorizing concepts into those which should be designated for full, partial, or conceptual understanding in first, second, third, and fourth year foreign language programs. Teachers in those programs must understand and be able to identify the four levels of competence defined by the American Council on the Teaching of Foreign Languages and the Educational testing Services and modeled on the Defense Language Institute's Rating Scale. Those four levels of competence are: novice, intermediate, advanced, and superior; there are sub-levels for each of these levels except the superior level. Each level is defined in terms of function: what communicative tasks students are able to perform with the language; context/content: where these communicative tasks are performed and to what extent; and accuracy: how well students are able to perform these tasks (Figure #2).

FUNCTIONAL TRISECTION OF ORAL PROFICIENCY LEVELS

Oral Proficiency Level	Function (Tasks accomplished, attitudes expressed, tone conveyed)	Context (Topics, subjects areas, activities activities and job addressed)	Accuracy (Acceptability, quality and accuracy of message conveyed)
5 (Superior)	Functions equivalent to an educated native speaker (ENS).	All subjects.	Performance equivalent to an ENS.
4 (Superior)	Able to tailor language to fit audience, counsel, persuade, negotiate, represent a point of view and interpret for dignitaries.	All topics normally pertinent to professional needs.	Nearly equivalent to an ENS. Speech is extensive,precise, appropriate to every occasion with only occasional errors.
3 (Superior)	Can converse in formal and informal situations, deal with unfamiliar topics, provide explanations, describe in detail, offer supported opinions, and hypothesize.	Practical, social professional and abstract topics, particular interests, and special fields of competence.	Errors virtually never interfere with understanding and rarely disturb the native speaker. Only sporadic errors in basic structures.
2 (Advanced)	Able to fully participate in casual conversations, can express facts, give instructions, describe, report, and provide narration about current, past and future activities.	Concrete topics such as own background, family, interests, work, travel, and current events.	Understandable to native speaker not used to dealing with foreigners. Sometimes miscommunicates.
1 (Intermediate)	Can create with the language, ask and answer questions, participate in short conversations.	Everyday survival topics and courtesy requirements.	Intelligible to native speaker used to dealing with foreigners.
0 (Novice)	Can enumerate, recycle, say learned words or phrases.	Learned material, e.g. numbers, dates, days, weather, time, foods, names of family members, etc.	Sometimes intelligible.

(Figure 2)

PROBLEM

This research project compares second semester college Spanish classes taught under the guidelines of Teaching for Competency with classes taught using the audio-lingual method in conjunction with other traditional elements. The purpose was to determine to what an extent, if at all, students in the Teaching for Competency classes would out perform those in the other classes. A 95% confidence interval estimate will be constructed based on scores of pre and post-tests.

For the Listening Test, students listened to a tape recording which presented a statement, a question, or a conversation; the students then responded to forty multiple choice questions choosing the most appropriate answer.

The second part of the pretest, the Reading portion, involved the reading of fifty multiple choice questions. Students either completed a phrase or a sentence or answered questions in which vocabulary knowledge was demonstrated. Toward the end of the semester and before final exams, the same test was repeated.

Both experimental classes were also given the Oral Proficiency Interview Test and the Teaching for Competency Writing Test. Additionally, one of the experimental classes was given the Teaching for Competency Reading Test. (Since the last two tests mentioned are being copyrighted, it is not possible to include samples.)

METHODOLOGY

Two experimental classes of Spanish 1B were taught during Spring Semester 1987 using the Teaching for Competency guidelines. In order to evaluate the results, two control groups were monitored. In control class #1 a traditional teaching approach was used. In control class #2 the Natural method was used in conjunction with the Total Physical Response Techniques and Dr. Lozanov's principles of learning.

A pretest utilizing the Listening and Reading portions of the 1963 MLA Cooperative Foreign Language Test, form LA for Spanish was administered to all four groups. Twenty-five minutes were allotted for the completion of each portion except control class #2 was given a total of sixty minutes to complete the tests. The pretest was repeated as a post-test at the end of the semester, but control class #2 did not participate.

a. Data Collected

Number of correct responses were tabulated on the Listening portion (40 points) and the Reading portion (50 points) of the MLA Cooperative Foreign Language Test form LA for Spanish for two experimental Spanish 1B classes and control class #1. Scores represent the pre and post test.

b. Data Analyzed

For the n = 22 students in the experimental classes, the difference in their scores on the post-test versus the pre-test on the listening and reading parts were computed.

d_1 = post-test student 1 - pre-test student 1
d_2 = post-test student 2 - pre-test student 2
" " " " "
" " " " "
" " " " "
" " " " "
d_{22} = post-test student 22 - pre-test student 22

Thus a paired-dependent distribution was formed for the 22 data points. The following results were obtained:

For the Listening Part:

a. The mean of the paired differences was $\bar{d} = 2.86$.

b. The standard deviation for the distribution of differences was $S = 4.06$.

For the Reading Part:

a. The mean of the paired differences was $\bar{d} = 4.09$.

b. The standard deviation for the distribution of differences was $S = 3.85$.

Since 22 data points were obtained, a confidence interval estimate can be formed for the mean difference in listening and reading scores for the population of difference by using a t-distribute with degrees of freedom 21 (= n-1). From a standard table of t-values the following coefficient factor was obtained:

95% confidence coefficient 2.080

The following formula was used to construct the confidence interval estimates:

Upper limit = $\bar{d}$ + (table factor) $\frac{s}{\sqrt{n}}$

Lower limit = $\bar{d}$ - (table factor) $\frac{s}{\sqrt{n}}$

1. For the 95% confidence interval estimate for the Listening Part:

$$\text{Upper limit} = 2.86 + 2.080\left(\frac{4.06}{\sqrt{22}}\right) = 4.66$$

$$\text{Lower limit} = 2.86 - 2.080\left(\frac{4.06}{\sqrt{22}}\right) = 1.06$$

Thus, based on the given data, a 95% confidence interval estimate for the difference in post versus pre-test scores on the Listening Part is between 1.06 and 4.66.

2. For the 95% confidence interval estimate for the Reading Part:

$$\text{Upper limit} = 4.09 - 2.518\left(\frac{3.85}{\sqrt{22}}\right) = 6.16$$

$$\text{Lower limit} = 4.09 - 2.518\left(\frac{3.85}{\sqrt{22}}\right) = 1.98$$

Thus, based on the given data, a 95% confidence interval estimate for the difference in post versus pre-test scores on the Reading Part is between 1.98 and 6.16.

A hypothesis test at the 5% level of significance was also used on the results to show that the observed difference reflect a difference in student abilities, and was not the result of chance. For this test, μ_d is the mean difference for the population of paired difference.

<u>For the Listening Part:</u>

$H_o : \mu_d = 0$
$H_a : \mu_d > 0$

<u>For the Reading Part:</u>

$H_o : \mu_d = 0$
$H_a : \mu_d > 0$

The test statistic for both tests will be the same:

$$T = \frac{\bar{d}}{\frac{s}{\sqrt{n}}}$$

If $T > t_c$ (= 2.080), then reject H_o; otherwise do not reject H_o.

Using $\bar{d} = 2.86$ and $s = 4.06$:

$$T = \frac{2.86}{\frac{4.06}{\sqrt{22}}} = 3.304$$

Using $\bar{d} = 4.09$ and $s = 3.86$:

$$T = \frac{4.09}{\frac{3.86}{\sqrt{22}}} = 4.97$$

For both tests the T values obtained are greater than t . Thus, based on the given data, there is sufficient evidence with α = 0.05 to force the conclusion that the method used to teach these students was effective in increasing their test scores on the listening and reading parts of the test.

c. Data Results/Interpretation

Based on the data compiled, a 95% interval estimate for the difference in post versus pre-test scores on both the Reading and Listening Tests leads to the conclusion that Teaching for Competency was effective in increasing students' scores in the two experimental classes. The observed difference in scores reflects a difference in students' performance and was not the result of chance.

SUMMARY/CONCLUSION

During the year in which I was involved in the Teaching for Competency program and used principles for competency, it was difficult at times to break away from the old pattern of stressing grammatical concepts. I kept reminding myself of the functional trisection (function, content/context, and accuracy) during each class meeting, and I kept targeting my teaching to focus on students' communication.

This research project allowed me to see that Teaching for Competency principles can be very successful in teaching second language acquisition by increasing the scope and functions of students' performance concomitantly.

The attitude, motivation, and participation of students in the Teaching for Competency Program was greater than in previous classes, and students were much more committed to learning and to exposing themselves to new learning experiences.

PROBLEMS/LIMITATIONS

There were a number of unexpected problems which hampered this research project:

1- The post-test was not administered to students in control class #2. Thus, the results of the pre-test were invalidated.

2- The make-up of control group #1 was not comparable to the students in the experimental classes as there were a number of native Spanish speakers who scored very highly in the pre and post tests. Among those native speakers, the percent of change between the pre and post tests was not significant.

3- The California Foreign Language Competency Test in Reading Comprehension Spanish Form B was administered to one of the two experimental classes but not to the control classes.

4- The Oral Proficiency Interview was given to the two experimental classes but not to the control classes.

REPLICATION

An attempt was made to establish two control groups, but problems arose and the comparison could not be made. The major problem involved obtaining the commitment of colleagues to participate in someone else's research project. This difficulty was linked to problems in testing, for testing involves taking time away from teaching and the reality is that not every colleague is willing to include additional testing in his/her already crowded syllabus.

The Oral Proficiency Interview is extremely time consuming for the instructor and should be given outside of class time. A minimum of thirty minutes per student is required, and it can be administered and evaluated only by those who have been trained or are certified by ACTFL as Oral Proficiency Interview Raters.

Should funds be available in the future, it may be possible to further explore this same research project; however, more controls must be applied.

Some suggestions:

1- The pre and post-tests could be administered by the Assessment Center or by a specialist in the Learning Center; this would save valuable class time and, perhaps, would encourage colleagues to be more receptive in making a commitment to participate.

2- Control groups should be chosen carefully in order that they be comparable as much as possible.

Math Skills and the Hand held Calculator

A Research Project Conducted By
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Spring Semester 1987

GENERAL OVERVIEW

This project is intended to determine the effect on students learning math with and without the use of a hand held calculator. The experimental groups are a Math A (Beginning Algebra) class and a Math 13 (Intermediate Algebra) class with students required to purchase and have available a calculator. The teacher for this group will provide instruction on their correct use. The control groups consist of a Math A class and two Math 13 classes taught by a different instructor. These students will not be permitted to use a calculator. Students in both groups will be given two pre and two post tests. One test will be taken without a calculator and one with a calculator. The tests will be compared to determine any differences.

DESCRIPTION

GOALS AND OBJECTIVES

The hand held "pocket" calculator has been made small and inexpensive. They are so common place that they are given away free in boxes of laundry soap. Are they good or bad for the general population? Are they good or bad for the student studying Mathematics? There were three questions concerning hand held calculators that are to be addressed in this study.

Question #1. Do Mathematical computational skills (i.e. the ability to get the correct arithmetic answer) improve when using a hand held calculator?

Most of the daily mathematical computations done in business are done on machines. These machines can be computers, electronic cash registers or calculators. If students in a classroom are given the opportunity to use a calculator will their computations be any better than if they were done with paper and pencil?

Question #2. Does actual classroom instruction on the use of the hand held calculator improve calculator skills?

Are calculators easy enough to use that students can learn to operate them on their own? Are the manuals that are supplied with calculator good enough to provide adequate instruction? Or is it beneficial to have personal instruction on the use of the calculator?

Question #3 Does the study and use of the hand held calculator improve the general overall understanding of Mathematics?

If a student uses a calculator to rid himself of the drudgery of computation does that allow him to better understand mathematical ideas in general? Can students better understand concepts if allowed to use a calculator? Does a calculator increase interest in mathematics? Does a calculator provide a stimulus to learn more mathematics?

I think that the answer to all three questions, #1, #2 and #3, is yes. Computational skills should improve using a calculator whether or not a student has been given formal instruction. There is also a concern that traditional paper and pencil calculating skills will suffer. I do not know if that will be the case or not. In addition, instruction on the proper use of the calculator and practice should improve the students' ability to use the device. The most important, but probably the most difficult question to answer, is question #3. Students should show an overall improvement in their studies of mathematics when allowed to use a calculator.

METHODOLOGY

A seventeen question test consisting of a variety of mathematical questions was created. The questions covered topics in arithmetic (decimal addition, subtraction, proportions and fractions), standard algebra (order of operations, square root, logarithms and evaluating polynomials) and topics not normally covered in a beginning or intermediate algebra course (binomial expansion and factorial values). Four versions of the test were made. The four tests were designed to be as similar as possible and in most cases numerical values were changed to alter the final outcome.

At the beginning of the semester two pre tests were given to all of the students on two consecutive days. On the first test (1A) students were NOT allowed to use a calculator. On the second test (1B) students WERE allowed to use a calculator. Students supplied their own calculator or were provided with one for the test. At the end of the semester the same type of testing was repeated for the post tests. The first test (2A) was given WITHOUT the use of a calculator and the second test (2B) was given and students WERE allowed to use a calculator. All students in the test group and control group were given the same 1A test, same 1B test, etc.

Students were timed and not allowed to have more than fifteen (15) minutes to work on test questions. The tests were administered during the last fifteen minutes of a normal class period. There was no special preparation, reviews or handouts provided for either the test or control groups. There was no special consideration or motivation in the form of grades or points given to students. They were merely asked to participate in a study and to do the best that they could on the test. Tests were not returned to the students nor were any of questions or answers to the questions discussed.

The time of fifteen minutes was chosen so as not to take too much time away from the normal class. It also seemed to be short enough a time to keep students interested in taking the test and giving it a good effort.

With the four exams and a test and control group, numerous comparisons could be made. That is, comparisons with and without calculators (within a class as well as against a control group) and progress from pre and to post tests.

a. DATA COLLECTED

Each test was hand graded and a record concerning the correctness of each question as well as the overall test score were kept. In this fashion overall scores could be compared as well as, if need be, individual test items. As a result, a wealth of data was collected. That is to say, more data than could be analyzed within the constraints of this project.

b. DATA ANALYZED

Hypothesis Test 1 — Comparing the mean scores of the pre-tests for Population 1 (the experimental class Math 13) and Population 2 (the control class Math 13).

Test 1-A Non-calculator Test

$H_0 : \mu_1 - \mu_2 = 0$
$H_a : \mu_1 - \mu_2 \neq 0$

Test 1-B Calculator Test

There is no difference in the means. One class does better than the other class.

A 5% level of significance is used for both tests.
For both tests the test statistic will be:

$$Z = \frac{\bar{x} - \bar{y}}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

If $Z <$ lower z_c $(= -1.96)$ or $Z >$ upper z_c $(=1.96)$, then reject H_0.

For Test 1-A

$\bar{x} = 6.55$, $s_1^2 = 4.452$, $n_1 = 20$

$\bar{y} = 6.58$, $s_2^2 = 5.168$, $n_2 = 66$

$$Z = \frac{6.55 - 6.58}{\sqrt{\frac{4.452}{20} + \frac{5.168}{66}}} = -0.05$$

For Test 1-B

$\bar{x} = 8.65$, $s_1^2 = 5.382$, $n_1 = 20$

$\bar{y} = 8.63$, $s_2^2 = 7.231$, $n_2 = 66$

$$Z = \frac{8.65 - 8.63}{\sqrt{\frac{5.382}{20} + \frac{7.231}{66}}} = 0.03$$

Conclusion: For both tests, do not reject H_0. That is, there is not sufficient evidence to force the conclusion that there was a significant difference between the abilities of the experimental and control classes based on the pre-test results for parts 1-A and 1-B.

Hypothesis Test 2 Comparing the mean scores for the post-tests for Population 1 (the experimental class Math 13) and Population 2 (the control class Math 13).

Test 2-A Non-calculator Test **Test 2-B Calculator Test**

$H_o : \mu_1 - \mu_2 = 0$
$H_a : \mu_1 - \mu_2 > 0$

There is no difference in the means. The experimental class does better than control class.

A 5% level of significance is used for both test.
For both tests the test statistic will be:

$$Z = \frac{\bar{x} - \bar{y}}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

If $Z > z_c$ (= 1.65), then reject H_o .

For Test 2-A

$\bar{x} = 8.73$, $s_1^2 = 7.023$, $n_1 = 11$

$\bar{y} = 8.13$, $s_2^2 = 6.347$, $n_2 = 43$

$$Z = \frac{8.73 - 8.13}{\sqrt{\frac{7.023}{11} + \frac{6.347}{43}}} = 0.68$$

For Test 2-B

$\bar{x} = 11.09$, $s_1^2 = 5.290$, $n_1 = 11$

$\bar{y} = 9.55$, $s_2^2 = 5.426$, $n_2 = 43$

$$Z = \frac{11.09 - 9.55}{\sqrt{\frac{5.290}{11} + \frac{5.426}{43}}} = 2.54$$

Conclusion: Since 0.68 < 1.65, do not reject H_o. There is not sufficient evidence to force the conclusion that the experimental class did significantly better than the control class on the post-test non-calculator part.

Conclusion: Since 2.54 > 1.65, reject H_o . There is sufficient evidence to force the conclusion that the experimental class did significantly better on the post-test calculator part than the control class.

Hypothesis Test 3

Comparing the Post versus Pre test scores for the experimental Math 13 class using paired data points. For this test the paired differences are the individuals that took the Post and Pre test scores on the A (non-calculator) and B (calculator) portions.

d = Individuals post-test score - Individuals pre-test score

For comparing 2-A versus 1-A **For comparing 2-B versus 1-B**

$H_0 : \mu_d = 0$
$H_a : \mu_d > 0$

There is no difference in the test scores. The post-test scores are higher than the pre-test scores.

For both tests a 5% level of significance is used.
The test statistic will be:

$$T = \frac{\bar{d}}{\frac{s_d}{\sqrt{n}}}$$

If $T > t_c$ (=1.860), then reject H_0 .

For test 2-A versus 1-A

$\bar{d} = 2.55$, $s_d = 1.810$, $n = 9$

$$T = \frac{2.55}{\frac{1.810}{\sqrt{9}}} = 4.227$$

For test 2-B versus 1-B

$\bar{d} = 1.78$, $s_d = 1.787$, $n = 9$

$$T = \frac{1.78}{\frac{1.787}{\sqrt{9}}} = 1.988$$

Conclusion:

For both tests, reject H_0 . There is sufficient evidence to force the conclusion that students scored significantly higher on both the non-calculator and calculator portions of the post-tests when compared to the pre-tests.

Hypothesis Test 4

Comparing the calculator assisted versus the non-calculator test scores for the experimental Math 13 class using paired data points. For these tests the paired differences are the individuals that took the A and B portions of the pre-tests and the post-tests.

d = Individuals score on calculator test − Individuals score on non-calculator test

For comparing 1-B versus 1-A

$H_0 : \mu_d = 0$
$H_a : \mu_d > 0$

There is no difference in the test scores. The calculator assisted test scores are significantly higher than the non-calculator test scores.

For comparing 2-B versus 2-A

For both tests a 5% level of significance is used.
The test statistic will be:

$$T = \frac{\bar{d}}{\frac{s_d}{\sqrt{n}}}$$

If $T > t_c$ (= 1.729 for the pre-test comparison and = 1.812 for the post-test comparison), then reject H_0 .

For 1-B versus 1-A test

$\bar{d} = 2.10$, $s_d = 2.360$, $n = 20$

$$T = \frac{2.10}{\frac{2.360}{\sqrt{20}}} = 3.98$$

For 2-B versus 2-A test

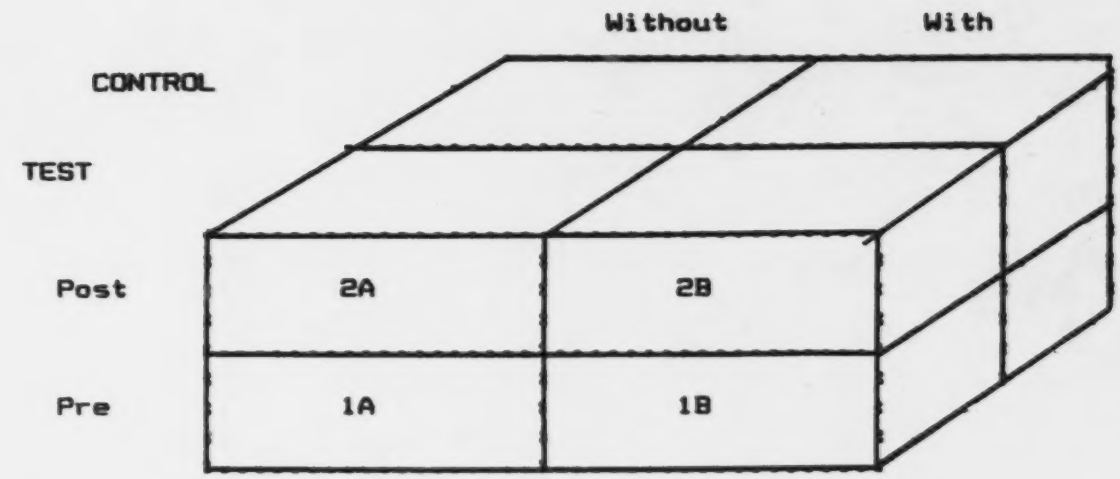
$\bar{d} = 2.36$, $s_d = 2.580$, $n = 11$

$$T = \frac{2.36}{\frac{2.580}{\sqrt{11}}} = 3.32$$

Conclusion:

For both tests, reject H_0. That is, there is sufficient evidence to force the conclusion that the calculator assisted test scores for both the pre and post tests were significantly higher than the non-calculator assisted test scores.

c. Data Results/Interpretation



STUDENTS CAN COMPUTE BETTER WITH A CALCULATOR THAN WITHOUT A CALCULATOR.

Question #1 Do Mathematical computational skill improve when using a hand held calculator?

Based on the results of Hypothesis Test #4, the experimental Intermediate Algebra class showed significantly higher scores on tests where calculators were used as compared to tests where calculators were not used. There was significant improvement in scores both in the Pre and Post test series indicating that with or without classroom instruction and practice students can compute better with a calculator than without a calculator. Hypothesis test results for the Beginning Algebra class are not provided here but produced the same results as the Intermediate class. This horizontal comparison of data (see diagram above) matched test 1A with 1B and test 2A with 2B.

It is also important to note at this juncture that the non-calculator test scores (2A) did not go down. To the contrary, test scores on the post non-calculator exam improved! This indicates that traditional paper and pencil computational skills did not suffer even though a calculator was used whenever needed throughout the semester.

CLASSROOM INSTRUCTION ON THE USE OF THE CALCULATOR IMPROVES CALCULATOR SKILLS.

Question #2 Does actual classroom instruction on the use of the hand held calculator improve calculator skills?

Hypothesis Test #1 establishes the fact that the experimental and the control groups were basically the same. There was no significant difference between the abilities of the two groups. That is to say, they were at parity. Based on the results of Hypothesis Test #2, the experimental group did significantly better on the Post calculator test (2B) than the control group. This indicates that the in class instruction was beneficial. Students in the experimental group had a better understanding and were better able to use the calculator than the control group.

GENERAL UNDERSTANDING OF MATHEMATICS IS IMPROVED BY USING THE HAND HELD CALCULATOR.

Question #3 Does the study and use of the hand held calculator improve the general overall understanding of Mathematics?

A vertical comparison of test scores was made in an attempt to answer this question. Hypothesis Test #3 compared exam 2A with 1A and exam 2B with 1B. Based on the results of this test it can be concluded that students scored significantly higher on both non-calculator and calculator exams. Using just the experimental Intermediate Algebra class, it appears that the use of the calculator helped students in their overall understanding of Mathematics. Note, that when compared to the control group, the experimental group had more of an improvement on test 2A. But this improvement was found to be statistically insignificant. A larger sample size would have provided better statistical results. (see Hypothesis Test #2)

SUMMARY/CONCLUSION

Students should be allowed to use a calculator in their normal studies of mathematics. The device allows for more accurate (and probably faster) computation. Instruction (and practice) improves the ability to use the calculator. And the calculator helps to improve general understanding of mathematics, be it calculator or non calculator related material.

PROBLEMS/LIMITATIONS

There were a few minor problems that were not foreseen. Not all students were present at all four test sessions. Not all students put their name on their tests papers. Because of the above two problems several useful bits of data could not be used.

There were some minor problems procuring calculators for the control group which causes some delay in giving the pre tests.

REPLICATION

The test given to the groups was the most critical part of the project. In the future a committee of instructors could produce a test that might be a better measuring device. It would also lend more creditability to the study if the contents of the test were kept from the instructors of the experimental and control groups. In this study every effort was made not to 'teach to the test.' A 'blind' study would remove any doubts.

Instructional Methods For Teaching Comprehension Skills

A Research Project Conducted By
Del Prescott
Languages and Literature Division
Sacramento City College
Spring Semester 1987

DESCRIPTION

This study compared two methods of teaching reading comprehension skills to students whose scores fall between the seventh and the ninth grade as measured by the college assessment office.

One section of English 70, Basic Reading Skills, was taught using the AVT Learning System in Reading published by the Media Systems Corporation, a subsidiary of Harcourt, Brace, and Jovanovich. This system places students in one of three levels, diagnoses their skill deficiencies in ten comprehension skills, introduces those comprehension skills with a sound/ slide presentation, teaches those skills with audio presentations, and then requires extensive self corrected practice in exercise booklets before testing for mastery. Mastery tests follow the completion of each booklet, and review booklets combine several skills.

A second section of English 70 was taught using a more traditional method: lecture, discussion, homework from a skills textbook and a weekly lab activity from a variety of publications by Jamestown, Barnell Loft, and SRA. Both groups met five hours per week during the eighteen week semester.

The basic question under examination in this study was: How effective is a reading skills program which requires minimal instructor intervention?

METHODOLOGY

Data for this study was collected from two reading skills classes at Sacramento City College. Both classes were made up of students who were placed in English 70 by the regular college assessment procedure. Both classes were taught by the same instructor. The control group was taught in the college Reading Laboratory, which is part of the Division of Languages and Literature. The experimental group was taught in the Learning Center, which is part of the Division of Learning Resources. The AVT system required the use of audio-visual hardware which was only available in the Learning Center. Both sections had an instructor three hours a week. A trained paraprofessional and peer tutors were available whenever students worked in the labs.

Data collected consisted of scores from pre and post testing. The Stanford Diagnostic Reading Test (SDRT), Blue Level Form G, was administered for the pre test during the first week of classes, and the Blue Level Form H was administered for the post test during the seventeenth week of the semester. The Blue Level of the SDRT is intended to be used with low achieving students in grades nine through twelve and in community colleges. In addition to this standardized test, both groups were given the Placement Test, which is part of the AVT materials. This test places students in one of three levels within the AVT skills lessons. Form A of this placement test was administered as both a pre test and a post test.

For the SDRT, both the "Raw Score" and "Grade Level" results are compared. The comparisons were made by computing the differences in the pre and post scores of each student in both the Experimental and Control classes. The means of the differences were then tested using a 5% level of significance.

DATA RESULTS

For this study, the following symbols were used:

Experimental Class	Control Class
Student 1: x_1 =Post test - Pretest	Student 1: y_1 =Post test - Pretest
Student 2: x_2 =Post test - Pretest	Student 2: y_2 =Post test - Pretest
" " "	" " "
" " "	" " "
" " "	" " "
Student 11: x_{11}=Post test - Pretest	Student 16: y_{16}=Post test - Pretest

A. For the SDRT "Raw Score" data:

$\bar{x} = 3.727$ $\qquad$ $\bar{y} = 4.500$

$s_1 = 6.754$ $\qquad$ $s_2 = 7.916$

The $\bar{x}$ and $\bar{y}$ are respectively the means of the Experiment and Control class differences. The s and s are respectively the standard deviations for the distributions of differences for the two data sets. Let μ_1 be the mean difference for the population of Experimental students and μ_2 be the mean difference for the population of Control students.

$H_o : \mu_1 - \mu_2 = 0$ (There is no difference in the change in the scores.)

$H_a : \mu_1 - \mu_2 < 0$ (The Control class scores show a greater change.)

A 5% level of significance will be used.
The test statistic will be:

$$T = \frac{\bar{x} - \bar{y}}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

If $T < t_c$ (= - 1.708), then reject H_o . The t_c value was obtained from a t-table using $n_1 + n_2 - 2$ degrees of freedom. Thus a t-distribution with degrees of freedom 25 was used.

With $\bar{x} = 3.727$, $s_1 = 6.754$, $n_1 = 11$, $\bar{y} = 4.500$, $s_2 = 7.916$, and $n_2 = 16$:

$$T = \frac{3.727 - 4.500}{\sqrt{\frac{6.754^2}{11} + \frac{7.916^2}{16}}} = - 0.272$$

Since - 0.272 > - 1.708, do not reject H_o . That is, there is not sufficient evidence to force the conclusion that a difference exists in the change in Raw Scores for the Experimental and Control classes as measured by the SDRT.

B. For the SDRT "Grade Level" data:

$\bar{x} = 1.036$ $\bar{y} = 1.100$

$s_1 = 1.964$ $s_2 = 2.768$

The $\bar{x}$ and $\bar{y}$ are respectively the differences in the grade levels for the Experimental and Control classes respectively. The s_1 and s_2 are the standard deviations for the distributions of differences for the two data sets.

Let μ_1 and μ_2 be the mean differences in grade levels respectively for the populations of Experimental and Control students.

$H_0 : \mu_1 - \mu_2 = 0$ (There is no difference in the change in grade levels.)

$H_a : \mu_1 - \mu_2 < 0$ (The difference in grade level for the Control class is higher.)

A 5% level of significance will be used.

The test statistic will be:

$$T = \frac{\bar{x} - \bar{y}}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

If $T < t_c$ (= - 1.708), then reject H_0 .

With $\bar{x} = 1.036$, $s_1 = 1.964$, $n_1 = 11$, $\bar{y} = 1.100$, $s_2 = 2.768$, and $n_2 = 16$:

$$T = \frac{1.036 - 1.100}{\sqrt{\frac{1.964^2}{11} + \frac{2.768^2}{16}}} = - 0.070$$

Since - 0.070 > - 1.708, do not reject H_0 . That is, there is not sufficient evidence to force the conclusion that the difference in the changes in grade level scores is not zero.

C. For the AVT Placement Test data:

Experimental Class	Control Class
$\bar{x} = 2.182$	$\bar{y} = 1.875$
$s_1 = 5.250$	$s_2 = 4.097$

Since $\bar{x}$ is greater than $\bar{y}$, an alternate hypothesis reflecting a possibility of $\mu_1 > \mu_2$ will be used.

$H_0 : \mu_1 - \mu_2 = 0$ (There is no difference in the changes in AVT test scores.)

$H_a : \mu_1 - \mu_2 > 0$ (The change in test scores is higher for the Experimental class.)

A 5% level of significance will be used.

The test statistic will be:

$$T = \frac{\bar{x} - \bar{y}}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

If $T > t_c$ (= 1.708), then reject H_0 .

With $\bar{x} = 2.182$, $s_1 = 5.250$, $n_1 = 11$, $\bar{y} = 1.875$, $s_2 = 4.097$, and $n_2 = 16$:

$$T = \frac{2.182 - 1.875}{\sqrt{\frac{5.250^2}{11} + \frac{4.097^2}{16}}} = 0.086$$

Since 0.086 < 1,708, do not reject H_0 . That is, there is not sufficient evidence to force the conclusion that a difference exists in the change in scores as measured by the AVT Placement test for the Experimental and Control classes.

SUMMARY

Overall, students seemed to have improved their reading comprehension skills by using the AVT Learning System in Reading. The data collected from the pre and post tests show that students in both groups improved. It would seem that students who practice their reading skills using this mediated lab approach show just as much improvement as do students who use a variety of reading materials and participate in lectures and discussions of skills. Students in the experimental group showed more improvement in the AVT Placement Test scores than did the students in the control group. This was expected: the control group was, of course, not exposed to the AVT materials. Therefore, they were not familiar with the structure of selections and questions.

What is most significant from this study is that the data show that students can improve their reading skills using a laboratory approach. Students' skills can be diagnosed and individual prescriptions can be given to students reading at this level of skills development. And if provided with adequate assistance when they have difficulty, students do show gains in overall reading ability.

PROBLEMS/LIMITATIONS

The AVT Learning System in Reading places the burden for improving skills on the student. The materials include a large number of practice paragraphs for each lesson. Even the fastest readers must spend twelve to fifteen hours on a skill before it is completed. While there is a minimum of instruction, in the traditional sense, it is essential that an instructor be available for explanation of skills being mastered. Frequently it was necessary to read exercises with a student in order to explain the ideas that were being considered and the skill that was being mastered. Students needed a lot of encouragement and reassurance that they were making progress.

The attrition rate for the two groups of students seemed not to show any significant difference. During the fourth week of instruction, fourteen students were enrolled in the experimental group while twenty-two were enrolled in the control group. Twelve students completed the experimental group and eighteen students completed the control group. The attrition rates were 14% and 18% respectively. While the AVT system is rigorous in its demand upon students' time and effort, it does not appear that it discourages students to any greater degree than a more traditional approach.

REPLICATION

If this study were to be replicated, it would be important to make two changes. First a larger sample of students should be used, and those students should be enrolled in classes taught by more than one instructor. And next, the choice of the SDRT Blue Level standardized test may not have been the best. Several students in both groups were at the top of the test scale at the beginning. A test with norm tables for college level students would be more appropriate.

The most important factor in replicating this study would be to insure that students have adequate tutorial assistance. All students had the opportunity to discuss the reading selections with a tutor at any time that they felt they needed support or explanation. While there was not always an instructor in the lab, a trained paraprofessional and at least two peer tutors were always circulating among working students. They examined students' work and encouraged students to discuss the content of the reading selections and continually monitored progress.

Prediction and Other Strategies Using Students' Experiential Background in Teaching Economics

A Research Project Conducted by
Linda L. Stroh
Business Division
Sacramento City College
Spring Semester 1987

As an economics instructor at Sacramento City College, I have consistently observed students' difficulty with the abstractness and vocabulary unique to this subject. I believe that much of this difficulty can be attributed to the gap between student reading levels and the reading level of the textbook. In the last year, I have used some strategies which relate economic issues and vocabulary to an individual student's "life" experiences. Educators believe that information is learned when it becomes a part of the long-term memory. The assignment to long-term memory is accomplished by relating new vocabulary and concepts to previous individual experiences.

It was assumed that the mean (average) grade of those students being taught using the experiential strategies would be higher than the mean (average) grade of those students who were taught without the strategies. Because my teaching style is different than my colleagues, I chose to compare previous sections of my own course with the current group enrolled in my Economics 1A, Macroeconomics, course. Population 1 consisted of all daytime sections taught between Fall Semester, 1983, and Spring Semester, 1986, inclusively. Population 2 included those sections taught since June, 1986. A systematic random sample of Population 1 yielded 40 students' names and final grades by selecting every third name on the final rosters which had been arranged chronologically. The sample for Population 2 was the section I taught Spring Semester, 1987.

The first step in the process was to test my students' reading levels using the TASK Reading Test. It assigns a grade level ranging from the sixth to the thirteenth grade. The arithmetic average of these reading levels for my current section of the course was approximately 10.5. The course textbook, Contemporary Macroeconomics, by Milton Spencer was also tested for readability and yielded an assessment of thirteenth grade level reading. Note that I have been concerned about the reading problem for several years and have carefully chosen a textbook which fits my teaching style. It is important to note that eleven of the forty students tested at the sixth grade reading level. Most of these students and others who read at a slightly higher level are ESL (English as a Second Language) students.

The major strategy used to bridge the reading gap was a technique called Prediction. This process allows students to use prior knowledge and/or experience to explore new concepts and/or ideas. Students are directed through various activities to "discover" or predict specific definitions of vocabulary words or theoretical concepts related to an academic discipline. An example of this technique is illustrated on Pages __ - __. It includes an evaluation by students of the particular activity. This particular exercise was designed to allow students to discover or "predict" the meaning of the "Human Capital Investment" concept and "Benefit/Cost Analysis" procedure used by economists. A similar approach was used to predict other economic issues such as unemployment, multiplier effects, etc.

Prediction Strategy

PURPOSE

Students will develop an understanding of the economic term, "Human Capital Investment" by investigating their own reasons for attending college. An insight into the Benefit/Cost Analysis concept will also be developed through carefully directed tasks.

STEPS

1. Students are assigned a four-paragraph paper addressing their motives for attending community college.

2. Content for each paragraph is as follows:

   PARAGRAPH #1: Discuss specific goals such as degree, vocational training, etc.
   PARAGRAPH #2: Detail various benefits of community college attendance.
   PARAGRAPH #3: Itemize all costs incurred--include fees, books, work time and pay lost, and leisure or free time.
   PARAGRAPH #4: Compare the costs and benefits and draw some conclusion about commitment to above goals.

3. Papers are submitted to instructor for review. Topic is introduced during second week of semester. Provides great insights into student goals, interests, etc. Students tend to be very open and honest about personal goals and constraints in achieving those goals. (Points are assigned for successful completion of the task.)

4. Papers are returned at the next session. A formal discussion of "Human Capital Investment" and Benefit/Cost Analysis follows.

RESULTS

1. Students are able to develop through group discussion, an appropriate definition of "Human Capital Investment".

2. The step-by-step procedure has demonstrated, in a simple format, the technique of Benefit/Cost Analysis that is an inherent part of any economic analysis.

3. Process allows for retention in "long-term memory" because process involved personal experience.

4. Prediction process eliminates some of the intimidation-factor of abstract theory.

EVALUATION FORM---Human Capital Investment Paper

1. Refer to exam I, question #46-49---how many of these questions did you answer correctly:

   _____

2. Please recall the writing assignment that you completed which related the "human capital investment" concept to your personal education plans and goals. You may review this assignment, if you have forgotten. Note that you were itemizing and analyzing the benefits and costs of your education. Also recall that this assignment was completed before any in-class discussion of the benefit/cost analysis method.

   Did your completion of the written assignment prior to the discussion of the theoretical case help to "de-mystify" the concept? Please be as specific as you can----yes or no, and why?

PLEASE DO NOT WRITE YOUR NAME ON THIS PAPER. This information is for classroom based research purposes only. Thank you.

Results of Survey---Prediction
Economics 1A (Macroeconomics)

Forty-eight students responded to survey sheet. All are currently enrolled in Economics 1A.

Question #1: Sample mean was 2.3125 with a sample standard deviation of 1.307. In comment section, many students indicated that they understood the concepts but had trouble with arithmetic calculations.

Question #2: Verbal responses were weighted on a scale of 1-5; definite "no" being a 1, no response a 3, and strong "yes" a 5. Sample mean was 3.79 with a sample standard deviation of 1.22.

SELECTED STUDENT COMMENTS:

*Helped to see concept in a more personal fashion; easy to generalize the personal analysis to other items.

*Overall, it's good to apply the economics to real life.

*Without the written assignment, I'm sure I would not have understood the questions on the test.

*It is a reality of what is happening.

*Allowed me to overlay the concept on my own experience.

Other efforts to enhance learning by using students' experiential background included constant referrals and class discussions about current economic happenings. The diverse backgrounds of the students allowed for comparisons of the United States economic issues with those of their native lands. Additionally, students were assigned a research paper which was submitted as 15% of their total grade. The topic for the paper was chosen by the student, subject to my approval. This choice allows the students to use their backgrounds, interests, etc., and build on that foundation. Topic choices included native governments and economic issues, a survey of the Compact Disc industry, IBM's relative position in the computer industry, and "Swatches", the faddish plastic watch. I have found students to be much more enthusiastic about a research project if the topic choice is theirs. Again, I believe that the process allows for long-term memory storage.

The use of a Skills Inventory Test could have provided additional information into the applicability of these strategies. It would seem that the use of students' experiential backgrounds when teaching economics helps to overcome some of the quasi-mathematical nature of the course. Typically, students who are mathematically-inclined find economics less intimidating than other students. Please note that I requested that the Grant provide me a Skills Inventory Test for use in my classroom but never received it.

Actual analysis of the data compared final grades from two populations with a sample size of 40 each. Final grades were assigned using a point system for grading purposes which weights 50% of the grade with exams and the other 50% includes a term paper, assigned activities/homework, and attendance. A statistical summary follows:

H_0: There is no significant difference between the mean grade for Population 1, (non-experiential strategies), and Population 2, (experiential strategies). That is, $\mu_1 = \mu_2$.

H_a: The mean grade for Population 1 is less than the mean grade for Population 2. That is, $\mu_1 < \mu_2$.

Population 1 (non-experiential strategies)

$n_1 = 40$

$\bar{x}_1 = 2.395$

$s_1 = 1.237$

Population 2 (experiential strategies)

$n_2 = 40$

$\bar{x}_2 = 2.450$

$s_2 = .815$

Normal Distribution is implied by the Central Limit Theorem:

$$z = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

$z = -.645$ (using sample data to calculate)

Using a significance level of .05, the critical value for z is -1.645.

Thus, while a mean grade of 2.45 is higher than 2.395, it is not significant at the .05 level. The decision is to FAIL TO REJECT the null hypothesis, H_0.

While I believe that these strategies are important in teaching economics, there are possible reasons why I did not find the mean difference significant at the 5% level. The primary difference is in the proportion of students who are ESL students in Population 1 and Population 2. In recent semesters 35-50% of my students have been ESL students. Paul Gould, Counselor to International Students, has told me that his advisees have described my course as fair but difficult. I personally believe that the student "grapevine" has marketed my teaching approach. A 95% confidence interval using the sample mean of 2.450 implies a range of 2.1974 to 2.7026. This is including the sample with a high proportion of ESL students.

In conclusion, while I did not find a statistical difference between population, I, as an educator, am aware of the change in attitude and enthusiasm of my students. I have observed an increase in both student enrollments and retention. I have presented the prediction strategy at three different workshops---two for community college instructors in all content areas and one for high school economics teachers. My ideas were met with enthusiasm and confidence.

As a footnote, I used the same statistical test as described above with my summer class of 1986 as the Population 2 sample. This particular class consisted of mostly English speaking students. The sample yielded a mean grade of 2.974. This is statistically significant at the 5% level when compared with the sample mean from Population 1.

REPLICATION

I believe that replication of this particular study could give additional information which could be of value to me, as well as other educators. Although I did not find a significant difference, in the statistical sense, between the two populations, I will continue to use the described strategies---I believe in them! I have seen the "light come on" in a student's eyes as the concept is made clear using the student's own life experiences. If I could repeat the study, I would like to administer the Learning Skills Inventory and try to relate grades earned to learning skills patterns. I believe that the more mathematically inclined student has an "edge" over other students in the economics class. But, I think that the use of an experiential approach helps to alleviate some of the disadvantage of the non-mathematical student. It would be useful if somehow we could also access all the reading levels of prior students, in order to compare the two populations more accurately.

I appreciated being a part of this study and, like all statisticians, must conclude with the suggestion that it is essential to continue this type of study because it impacts our students and the quality of instruction.

SACRAMENTO CITY COLLEGE

CLASSROOM BASED RESEARCH PROJECT

EXHIBITS

A. LETTER OF INVITATION TO ADVISORY COMMITTEE WITH BRIEF PROJECT ABSTRACT

B. LIST OF ADVISORY COMMITTEE MEMBERS

C. AGENDAS FOR 9/26/85 AND 2/25/86

D. MINUTES OF MEETINGS FOR 9/26/85 AND 2/25/86

E. ANNOUNCEMENT AND APPLICATION

F. LIST OF APPLICATIONS/SELECTED PROJECTS

G. APPLICATION RECEIPT LETTER

H. LETTER OF ACCEPTANCE

I. LETTER OF REJECTION

J. REPORT UPDATE

K. BIBLIOGRAPHY

L. EVALUATION INSTRUMENT

M. DISSEMINATION RELEASE

Exhibit A

Sacramento City College

3835 Freeport Boulevard, Sacramento, CA 95822

August 23, 1985

Dear

As a result of a proposal submitted to the Fund for Instructional Improvement, we have been awarded a grant to pilot a project on classroom based research during the 1985/86 academic year. This project will involve applied research conducted in the classroom which focuses on teaching strategies and learning outcomes.

The goals of this project are:

1) To train faculty in research methodologies which can be applied in the classroom.

2) To conduct seven classroom based research studies.

3) To develop a resource bank of professional papers documenting the results and methodologies of the research studies.

We would like to invite you to participate in an advisory capacity with other faculty and staff to assist with the planning and development of procedures related to the project goals. We recognize your time is at a premium; however, we do not expect the time commitment to be extensive. Your contribution to this effort will ensure the success of the project.

Attached for your review is the project abstract. We hope you will join us at the first meeting on Wednesday, September 11, 1985 from 12:00 - 1:00 p.m. in Library 1. If you are unable to attend, please call Kirk at Ext. 361.

Sincerely,

Kirk Wiecking

Marguerite Jones

MJJ/am

cc Charles Synold

SACRAMENTO CITY COLLEGE

LEARNING RESOURCES DIVISION

CLASSROOM BASED RESEARCH

Classroom Based Research is a project funded through a grant from the Fund for Instructional Improvement.

The purpose of this project is to improve teaching and learning through classroom based research. It is based on the premise that minor adjustments in teaching methodologies, when appropriately identified and implemented, can have a significant impact on learning.

There is a need for more than a single approach to instructional improvement to solve the variety of teaching and learning problems encountered in a community college classroom. There has also been a minimum of research carried out in the classroom which documents successful teaching strategies. This project will use organized and direct classroom based research models which focus on precise measurable issues affecting teaching and learning. This approach will concentrate efforts on techniques, processes, and outcomes and not simply data collection.

The objectives are to a) train faculty in classroom based research; b) conduct seven research studies; and c) develop a bank of resource materials for training and replication purposes.

The project will be implemented during 1985/86 using a team approach consisting of faculty from various instructional areas and staff from Research, Staff Development, Instructional Development, and data processing. A series of seminars, workshops, and training sessions will be conducted on specific topics and research methodologies. Seven faculty will be selected to receive intensive training and to carry out classroom based research projects.

Exhibit B

SACRAMENTO CITY COLLEGE

CLASSROOM BASED RESEARCH PROJECT

ADVISORY COMMITTEE

Wayne Anderson	Instructor, Physics
Carol Attoe	Instructor, Physical Education
Dorothy Bray	Associate Dean of Instruction
Barbara Cooke	Instructor, Nursing
Michael Friedlander	Instructor, English
Larry Hendrick	Assistant Dean, Humanities/Fine Arts
Marguerite Jones	Assistant Dean, Learning Resources
Don Johnson	Counselor
David Nagao	Instructor, Business
Kevin Ramirez	Assistant Dean, Social Sciences
Les Read	Instructor, Philosophy
Nancy Renkiewicz	Associate Dean, Research & Development
Joyce Schaeuble	Instructor, Psychology
Gene Sellers	Instructor, Mathematics
Kirk Wiecking	Instructional Media Librarian, Learning Resources

Exhibit C-1

SACRAMENTO CITY COLLEGE
CLASSROOM BASED RESEARCH PROJECT

AGENDA
Thursday, September 26, 1985
3:00 p.m. - Lib. 1

I. Overview

Fund For Instructional Improvement
Classroom Based Research 1985/86

--Goals

--Objectives

--Activities

--Outcomes

II. Recommendations For Implementation

--Pretraining Seminar Topic and Speakers

--Topics for Classroom Research

--Criteria For Faculty Selection

--Suggested Resources

III. Project Schedule

IV. Other Matters

Exhibit C-2

SACRAMENTO CITY COLLEGE
CLASSROOM BASED RESEARCH PROJECT

AGENDA
Tuesday, February 26, 1986
3:30 p.m. - Lib. 1

I. Update

Fund For Instructional Improvement
Classroom Based Research Project 1985/86

--Goals

--Objectives

--Activities

--Outcomes

II. Implementation Strategies

--Institutional Activities

--Topics For Classroom Research

--Criteria For Faculty Selection

--Suggested Resources

III. Project Schedule

IV. Other Matters

Exhibit D-I

SACRAMENTO CITY COLLEGE

CLASSROOM BASED RESEARCH PROJECT
Thursday, September 26, 1985
3:00 p.m. - Library 1

MINUTES

I. OVERVIEW

The meeting began with an explanation of the project as funded by the California Community College Chancellor's Office, Fund for Instructional Improvement. Copies of the project abstract, which describes the purpose, goals, objectives, and outcomes, were distributed for review. It was pointed out that the intent of the project is to keep research projects simple rather than complex. The principle being that minor issues may have a significant impact on learning.

II. RECOMMENDATIONS FOR IMPROVEMENT

Ideas for gaining faculty participation and ensuring success of the project were discussed. Issues raised included:

1. Advertising

The importance of an effective publicity effort was addressed. It was recommended that a creative flyer/ brochure be produced and distributed to inform faculty of the project and to generate enthusiasm.

2. Seminar Presentation

It was explained that one activity of the grant is to have a presentation to the college on the general topic of research in the classroom. It was agreed that more input is needed before a decision is made, and that the response to the flyer/brochure may provide a better idea of what may interest the faculty.

3. Topics for Research Studies

Identifying what type of instructional practice or idea is a worthwhile one for research wa explored. It was agreed that there are numerous options to select from, but more input is needed. Some of the topics suggested include:

a. The use of study guides

b. Beginning a class with instruction to student in SQ3R techniques

c. Use of feedback and corrective processes

d. Combining two disciplines

e. Targeting an accelerated class

f. Use of muscle memory in physical education

g. Case studies

4. Types of Research

The various types of research studies were discussed. It was again pointed out the classroom research is intended to be simple, not complex, fun, not tedious. It was agreed that all types of research projects would be appropriate, i.e., testing, survey/ questionnaire, descriptive, statistical, etc., provided they can be measured/documented.

It was strongly urged that 'statistical' counting services be provided to faculty that need and request such services, so they do not become bogged down in that part of the research endeavor.

5. Criteria for Selection

The grant has provided $7,000 for faculty stipends to complete classroom based research projects. The grant stipulates seven projects will be carried out and consequently seven $1,000 stipends would be available.

Discussion regarding selection of applicants was limited but it was pointed out that criteria will need to be identified to facilitate the selection process.

It is hoped there would be more than seven applications to choose from. It was commented that more input should be solicited for the selection process.

6. Project Tasks

It was explained that those individuals participating in an advisory capacity to the project are requested to help with ideas, review applications and make recommendations for projects to undertake, and review final report documents. It was explained that everyone would not be asked to participate in each task.

7. Training Sessions

The grant project suggested eight training sessions to prepare faculty for conducting the research projects. Through discussion, it was recommended that some of these sessions may be better used as individual consultation sessions for faculty to meet with resident experts for assistance.

III. SCHEDULING

Timing and the current faculty morale climate was mentioned for consideration in scheduling project activities. It was pointed out the desired time line is to complete the general campus presentation and training sessions prior to Spring term 1986 so faculty could use that period of time to carry out the projects.

KMW/am

Exhibit D-2

SACRAMENTO CITY COLLEGE

CLASSROOM BASED RESEARCH PROJECT
Tuesday, February 26, 1987
3:30 p.m. - Library 1

MINUTES

I. UPDATE

The meeting began with thanking those in attendance for participating in an advisory capacity. Then it was explained the project schedule had been revised to adjust for delays experienced during Fall Semester 1985. the intent of the project was reviewed and a descriptive summary (attached for those unable to attend) was distributed to provide an overview of the Classroom Based Research Project goals, objectives, proposed activities, and expected outcomes.

II. IMPLEMENTATION STRATEGIES

As a result of the first Advisory meeting, a draft announcement and application form was distributed for comments and suggestions. The project has been identified as PROJECT SEDRIC 1986 (Support of Educators Doing Research in the Classroom).

The information announcement served as a focal point for discussion, and many suggestions were made for improving and enhancing the announcement (a first draft copy is attached for those who were unable to attend). It was agreed that revisions would be made and the announcement distributed to inform faculty of a general meeting to learn more about the project and to explore ideas for doing research.

Discussion that followed emphasized the following points:

1. Ensure that classroom based research projects are kept simple to maintain the integrity of the grant goals and objectives.

2. Modify the initially proposed formal training sessions to a more informal research assistance process to achieve a more productive working situation with college faculty.

3. Provide stipends in equal amounts of $1,000 for seven faculty, as per grant amount of $7,000.

4. Schedule an open meeting time for faculty to learn more about the grant project and to explore ideas about types of classroom based research that can be conducted.

5. Where possible, tie research activity to institutional direction.

6. That the types of research projects are practically limitless, yet efforts should be made to encourage diversity and manageable projects.

7. Assistance should be individualized, where possible.

8. Criteria for selection should include representation from as many college divisions as possible, and the proposed research ideas manageable in order to expect completion, as well as the potential for replication. Also, that additional criteria needs be identified.

9. That there are many individuals within the institution who are experienced in certain research techniques and who may be available to provide assistance.

III. PROJECT SCHEDULE

The revised project schedule is as follows:

March	86	Announcement to College
April	86	Application/Selection
May - August	86	Preparation
Sept. - Dec.	86	Research and Report

IV. OTHER MATTERS

A draft application form for faculty to complete in proposing a research project was distributed. Many constructive comments were provided to improve the form, which will be revised and made available at the general campus meeting.

Next correspondence will provide the revised announcement and application form along with the date and time selected for the general campus meeting.

KMW/am

SACRAMENTO CITY COLLEGE

CLASSROOM BASED RESEARCH PROJECT

● PROJECT INTENT

To improve teaching and learning through classroom based research.

● PROJECT PURPOSE

To study teaching methodologies and/or classroom activities that can have an impact on learning. The focus of this project is on a teaching method that an instructor is already using (or may want to try) that he/she feels may improve students' chance of success.

To illustrate, the use of computer enhancement in a course may be evaluated. Or, the advantage of students bonding on students for support may be another type of project. This is the opportunity to have such projects put into a research design for validation.

● PROJECT SPECIFICS

Seven instructors will work during Spring 1987 on conducting classroom based research to improve teaching and learning.

The activity will begin with a workshop prior to the start of the Spring Semester, 1987. There will be continuous individualized assistance on conducting classroom based research throughout the project. This assistance will help the participants in the project decide on an appropriate research model.

● FACULTY SELECTION

Instructors will be chosen from applications submitted to the project steering committee.

● APPLICATION DEADLINE

January 8, 1987 is the deadline for application submission. Selected instructors will be notified by January 14, 1987.

● STIPEND

Participants will each be awarded a $1,000.00 stipend to compensate them for the extra time they will need to commit to the project.

● QUESTIONS

For additional information, please contact:

Marguerite Jones - Learning Resources Division - Ext. **253**
Gene Sellers - Science/Math/Engineering - Ext. **267**
Kirk M. Wiecking - Learning Center - Ext. **361**

A project funded by the California Community College Fund
for Instructional Improvement

SACRAMENTO CITY COLLEGE

CLASSROOM BASED RESEARCH
PROJECT APPLICATION

Name _____ Division _____

Phone _____

Briefly describe your idea for a classroom based research project you would like to conduct during Spring 1987.

_____

_____

_____

_____

_____

_____

_____

_____

_____

PLEASE FORWARD COMPLETED APPLICATION BY JANUARY 8, 1987

TO KIRK WIECKING, C/O LEARNING RESOURCES DIVISION

(Supported by a grant from the California Community College Fund
for Instructional Improvement)

Exhibit F-1

SACRAMENTO CITY COLLEGE

CLASSROOM BASED RESEARCH PROJECT

RESEARCH APPLICATIONS

		DIVISION
1.	Adlerian Philosophical Model	Humanities & Fine Arts
2.	Case Study Model for Computer Science 5	Business
3.	Characteristics of High Retention Instructors	Social Sciences
4.	Coherence Stick	Languages & Literature
5.	English Department Research	Languages & Literature
6.	Formal Student Grouping	Humanities & Fine Arts
7.	Integrating Content Area, Study, and Writing Skills Instruction	Humanities & Fine Arts
8.	Instructional Methods for Teaching Comprehension Skills	Languages & Literature
9.	Intervention Strategies for Student Retention	Social Sciences
10.	Math Skills and the Hand Held Calculator	Math/Science/Engineering
11.	Pilot Study of Human Services P	Learning Resources
12.	Planned Weekly Course Structure	Student Services
13.	Re-entry Students and Support Systems	Social Sciences
14.	Skills Intervention Instruction	Languages & Literature
15.	Prediction and Other Strategies Using Students' Experiential Background in Teaching Economics	Business
16.	Teaching for Competency	Languages & Literature
17.	Watson-Glazer Critical Thinking Test	Humanities & Fine Arts
18.	Writing Assignments Based on Imaginative Literature	Languages & Literature

SACRAMENTO CITY COLLEGE

CLASSROOM BASED RESEARCH PROJECT

SELECTED STUDIES

Classroom Research Study: Skills Intervention Instruction

Linda Briggs
Languages and Literature Division
(916) 449-7454

Classroom Research Study: Integrating Content Area, Study, and Writing Skills Instruction

Robert T. Carroll
Humanities and Fine Arts Division
(916) 449-7505

Classroom Research Study: Intervention Strategies for Student Retention

Barbara Davis
Social Sciences Division
(916) 449-7248

Classroom Research Study: Teaching for Competency

Liz Ginsburg
Languages and Literature Division
(916) 449-7336

Classroom Research Study: Math Skills and the Hand Held Calculator

Ron Hatton
Math, Science, and Engineering Division
(916) 449-7278

Classroom Research Study: Instructional Methods for Teaching Comprehension Skills

Delbert Prescott
Languages and Literature Division
(916) 449-7584

Classroom Research Study: Prediction and Other Strategies Using Students' Experiential Background in Teaching Economics

Linda Stroh
Business Division
(916) 449-7314

Sacramento City College

3835 Freeport Boulevard, Sacramento, CA 95822

Exhibit G

APPLICATION RECEIPT LETTER

TO:

FROM: Kirk Wiecking
Project Director

RE: Classroom Based Research Project Application

DATE: January 14, 1987

We have received your application for the Classroom Based Research Project. The Review Panel will be convened on Friday, January 16 to make its selection of participants. You will be notified as to the status of your application after selections have been made.

If selected, you will be requested to attend a planning session with Gene Sellers, Research Coordinator of the Project, on Wednesday, January 21.

KW/am

cc M. Jones
G. Sellers

Sacramento City College
3835 Freeport Boulevard, Sacramento, CA 95822

Exhibit H

REGRETS LETTER

Dear

The Classroom Based Research Project proposals have been evaluated by the Review Panel. I regret to inform you that your proposal was not one of those selected. The panel was impressed by the number of outstanding research proposals submitted, which made the selection even more difficult.

It is our intent to pursue subsequent funding should this pilot project prove to be successful. If other funds become available, we would encourage you to resubmit your proposal as we would like to continue validating the excellent teaching that takes place at Sacramento City College.

Sincerely,

Kirk M. Wiecking
Project Director

KMW/am

cc M. Jones
G. Sellers

Sacramento City College

3835 Freeport Boulevard, Sacramento, CA 95822

Exhibit 1

ACCEPTANCE LETTER

Dear

It gives me great pleasure to inform you that the Review Panel of the Classroom Based Research Project has selected your proposal as one of the seven to be implemented in the Spring, 1987. We look forward to your participation in this activity as it promises to make a significant contribution toward the improvement of teaching and learning in the community college classroom.

There will be a brief meeting of the Project participants on Wednesday, January 21 at 10:30 a.m. At this time, you will be briefed on the operational guidelines of the Project. Gene Sellers, Research Coordinator, will be available after this orientation meeting to consult with you on an individual basis regarding your research design.

This will be an exciting endeavor for all involved in this Project as we validate the excellent teaching that takes place at Sacramento City College.

Sincerely,

Wednesday, January 21, 1987
10:30 a.m. Library 1

Kirk Wiecking
Project Director

cc M. Jones
G. Sellers

Exhibit J

Sacramento City College

CLASSROOM BASED RESEARCH Report

Volume 1 No. 1 March 1987

Seven faculty at Sacramento City College are presently involved in conducting classroom based research projects to be completed during the Spring Semester 1987. Funded by the California Community College Fund for Instructional Improvement, the purpose of these projects is to study teaching methodologies and/or classroom activities that can have an impact on learning. The individual faculty research projects are described in this issue of Classroom Based Research Report and will be followed by more detailed information as the projects continue.

SKILLS INTERVENTION INSTRUCTION

This project is concerned with whether skills-intervention instruction has a positive effect on students' ability to: (1) read a textbook for understanding; (2) organize and write an essay answer; (3) answer text-related critical thinking questions of an inferential and/or evaluative nature; (4) view themselves as active, effective learners.

The study involves collecting data concerning the viability and value of skills intervention instruction (or instruction directly connected to but taught separately from a content course). This study may provide: (1) data for curriculum decisions about skills intervention instruction; (2) insight into the value of skills intervention instruction; and (3) information about the improvement of critical thinking skills through skills intervention instruction.

Research Faculty: Linda Briggs
Division: Languages and Literature

INSTRUCTIONAL METHODS FOR TEACHING COMPREHENSION SKILLS

The intent of this project is to determine the effectiveness of two instructional methods for teaching comprehension skills to English 70 students. One section of English 70 is being used as a control group. This class is being taught using the traditional method: textbook, lecture, discussion, and weekly lab activity. Another section is being used as the experimental group. This class is being taught through mediated instruction using the AVT Learning System in reading, which is a lab oriented teaching methodology and requires minimal teacher intervention. Standardized reading test scores given at the beginning and the end of the semester will be analyzed to determine whether or not there is a significant difference in the outcomes of the two methods.

Research Faculty: Del Prescott
Division: Languages and Literature

MATH SKILLS AND THE HAND HELD CALCULATOR

This project is intended to determine the effect on students learning math with and without the use of a hand held calculator. The experimental groups are a Math A class and a Math 13 class, with students required to use a calculator and the teacher providing instruction on the correct use. The control groups consist of two Math A classes and one Math 13 class taught by a different instructor, with students not permitted to use a calculator. Students in both groups will be given two pre and post tests. One test will be taken without a calculator and one with a calculator. The post tests will then be compared to determine whether or not a difference exists in the scores.

Research Faculty: Ron Hatton
Division: Science/Math/Engineering

Exhibit K

CLASSROOM BASED RESEARCH PROJECT

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Exhibit L

SACRAMENTO CITY COLLEGE
CLASSROOM BASED RESEARCH
EVALUATION

1. What is your opinion of the Classroom Based Research concept to improve teaching and learning?

Excellent Idea	Very Good Idea	Good Idea	Needs Refinement	Not Appropriate
1	2	3	4	5

2. The announcements for submitting an application to conduct Classroom Based Research were

Excellent Idea	Very Good Idea	Good Idea	Needs Refinement	Not Appropriate
1	2	3	4	5

3. The Application form to conduct a Classroom Based Research project study was

Excellent	Very Clear	Clear	Needs Improvement	Not Appropriate
1	2	3	4	5

4. The group seminars were

Extremely Helpful	Very Helpful	Helpful	Not Very Helpful	Not Appropriate
1	2	3	4	5

5. The seminars should have been conducted

Much More Frequently	More Frequently	As They Were	Less Frequently	Not at All
1	2	3	4	5

6. One to one consultations with the internal research advisor were

Extremely Helpful	Very Helpful	Helpful	Not Very Helpful	Not Appropriate
1	1	3	4	5

7. The individual sessions should have been conducted

Much More Frequently	More Frequently	As They Were	Less Frequently	Not at All
1	2	3	4	5

8. The entire project was

Very Well Organized	Well Organized	Organized	Not Very Well Organized	Not Applicable
1	2	3	4	5

9. The clerical assistant was

Excellent	Very Good	Good	Not Very Good	Not Applicable
1	2	3	4	5

10. The need for clerical assistance is

Extremely Important	Very Important	Important	Not Very Important	Not Applicable
1	2	3	4	5

11. Time provided to conduct the study was

More Than Sufficient	Very Sufficient	Sufficient	Less Than Sufficient	Not Applicable
1	2	3	4	5

12. The scope of your project was

Too Extensive	Very Extensive	Managable	Not Very Extensive	Not Applicable
1	2	3	4	5

13. Conducting classroom research is

Extremely Difficult	Very Difficult	Difficult	Not Very Difficult	Not Applicable
1	2	3	4	5

14. Your interest in this activity was

Extremely High	Very High	Average	Not Very High	Not Applicable
1	2	3	4	5

15. The potential for you to continue classroom based research study is

Extremely High	Very High	Average	Not Very High	Not Applicable
1	2	3	4	5

16. How interested do you think other faculty may be in conducting classroom research studies?

Extremely Interested	Very Interested	Interested	Not Very Interested	Not Applicable
1	2	3	4	5

17. Compared to other salary the stipend you received for your efforts was

Well Above the Norm	Above Norm	Equitable	Below Norm	Not Applicable
1	2	3	4	5

18. Would you recommend classroom based research studies be part of on-going staff development?

A Major Part	Considerable Part	Some Part	Minor Part	Not Applicable
1	2	3	4	5

19. What was the most significant part of the study for you?

_____

_____

_____

_____

20. The least significant?

_____

_____

_____

_____

21. Other comments?

_____

_____

_____

_____

_____

Sacramento City College

3835 Freeport Boulevard, Sacramento, CA 95822

Exhibit M

Learning Resources Division
(916) 449-7253

CLASSROOM BASED RESEARCH

The Learning Resources Division at Sacramento City College is pleased to announce the release of a report on Classroom Based Research.

Funded in part by the California Community Colleges Chancellor's Office, Fund for Instructional Improvement, this report presents the findings of seven classroom based research studies conducted at Sacramento City College during 1985-87.

The intent of the project was to improve teaching and learning by directly involving faculty in research efforts within their classrooms.

The report includes a description of project activities, research findings on seven studies conducted in various disciplines, and an evaluation of the project.

The project should be of great interest to anyone involved in professional or staff development at the community college. The report is available now and may be ordered at the cost of duplication. To obtain a copy, send a check for $ 5.00 made payable to the Learning Resources Division.

ERIC CLEARINGHOUSE FOR JUNIOR COLLEGES
NOV 02 1990